



Elite, the widely acclaimed 3-D space game, is the highest-selling game ever published for the BBC Micro and Acorn Electron. It is now available in enhanced versions specially produced for the 6502 Second Processor and the Master 128 Series.

In Elite, all players start as equals. With the initial rank of "Harmless," you will embark upon an experience unlike any that you have known before. You will be a space trader who roams the universe, making your living from buying and selling the cargo in your Cobra space craft. On your travels, you will encounter aggressors who are eager to put an end to your dealings.

Only the fittest will survive.

As you establish yourself as a survivor, you will win the right to a higher rank.

In all, there are nine, from "Harmless" to "Elite." And your computer will continually tell you where you stand.

The 51/4" disc version of Elife features a dual format design which allows Elife to be run under the following configurations:

- BBC Micro Models B and B+ with either a 40 track or 80 track disc drive.
- BBC Micro Models B and B+ with 6502 Second Processor and 80 track
- BBC Micro Master 128 or Turbo with 80 track disc drive.

Trade with 2,000 planets in eight galaxies

Besides survival, your success also depends on the rewards you reap from the cargo that you carry.

That cargo can be anything from foodstuffs to contraband. If you decide to frade in contraband, the rewards will certainly be higher. But so will the risks you take.

To ply your trade, you can dock at any of the 2,000 planets in eight galaxies.

However, before you dock, you must use your wits to assess the planet's political climate and the perils which may be waiting for you.

Also, in any of the eight galaxies, you may find yourself being asked to perform acts of considerable heroism and selfless courage. Although these will bring you into danger, they can bring considerable

rewards too

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News

All that's new in the ever expanding world of the Electron.



Adventures

More tips, clues and magic spells from our resident wizard as he endeavours to help those of you stuck in far away and long-forgotten lands.

Software Survey

From Repton 3 to
Ravenskull and Goal! –
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Al's Smiley Hunt

The second and final part of a short series designed to develop your programming techniqes.

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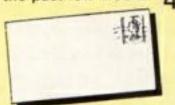
Grid Warrior

Have you the courage and skill to tackle the alien gladiators on a gigantic space energy grid?

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The pages you write yourselves. A selection from the many interesting letters you've been sending us over the past few weeks. 47





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You're on your own in Occupied France — facing the toughest test that a British pilot has ever had to experience!

DATABASE SOFTWARE

The year is 1943. As an RAF officer stranded in Occupied France you have one aim — to get back to Britain.

The only way to do this is to try to pass as a Frenchman, but if your French isn't good enough you risk capture and interrogation by the police or even the Gestapo.

Even the simplest tasks — from buying food to taking buses — place you at risk. And to add to your problems you've got limited funds: "Should I hitch a lift or take the train?", "Do I sell my belongings or get a job?"

Whatever you decide to do, time is short. And there are always people willing to denounce you . . .

French on the Run is that rare combination: A truly educational program that's also a thoroughly enjoyable game. This text adventure not only tests your grammar and vocabulary, but your knowledge of France and the French way of life.

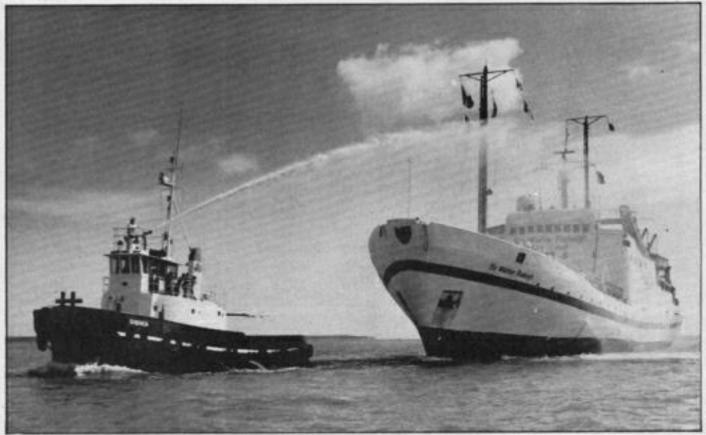
And as your French improves the language problems get harder and the situations become progressively more dangerous. There are four routes to complete in sequence — you need the password from the last before attempting the next. The standard of French required is about 0 level, though on the last route it rises to just below A level.

And there's a chance for you to try out the French you'll learn in practice:
We are offering a FREE WEEKEND IN PARIS as a prize to the first person to
get back to England alive, having broken a code near the end of the final route.

For teachers: French on the Run uses multi-choice questions with randomised distractors, all carefully chosen to illustrate linguistic points or points concerning things French. The program is meant for individual assessment, but can be used just as effectively for classroom work. A sealed envelope contains details of how the secret passwords are created.

TO ORDER TURN TO THE FORM ON PAGE 53

electron WEWS



Traditional fireboat salute for the Sir Francis Raleigh as she enters Cairns harbour

£1 million show spending spree

A £1 MILLION plus spend by visitors to the Christmas Electron & BBC Micro User Show provided the biggest ever cash sales bonanza for the event.

Once again the Electron took centre stage, almost eclipsing the BBC Micro in the process.

"If only companies would appreciate just what the demand is like for Electron products, then there would be so many more firms in this sector", said John Huddlestone, managing director of leading supplier Advanced Computer Products.

The opening day set the trend when all previous attendance figures were

broken as visitors took part in a mass pre-Christmas shopping spree.

Exhibitor after exhibitor reported demand at an alltime high as they were confronted by people eager to part with their money.

"When the doors opened you would have thought they were rushing in to take advantage of Harrod's sale", John Huddlestone told Electron User.

"They've come to look on this event as providing real bargains – and they obviously weren't disappointed".

In all almost 1,000 special offers were available during the course of the three day event. And of these almost half involved Electron products.

One customer alone – Craig Thomas, a teacher from Reading – spent more than £700 during a five hour visit on the Friday.

"I bought the Electron when it first came out and I've attended all the shows", he said.

"The beauty of them is that the bargains are such that they save you far more money than you spend.

"If you are an Electron user you just can't afford to miss the shows.

"Unless something drastic happens I'll be going up to the next one in Manchester in March".

Round the world Electron sails on

TO a traditional fire-boat welcome, the Sir Walter Raleigh steamed into the harbour at Cairns, Australia recently on the latest stage of its round-the-world adventure.

The ship had completed a 7,500 miles trans-Pacific journey from Southern Chile, undertaking scientific studies and community projects at a dozen islands on the way.

The 20 young men and women on board, between the ages of 17 and 24, are doing important scientific work for Operation Raleigh wherever the vessel stops.

But in their leisure time they can often be found at the keyboard of one of the Electrons with which the expedition has been equipped.

The venturers, as they are called, have taken a selection of Electron games and entertainment software with them to enjoy when off-duty.

Reports filtering back to Electron User say their favourite program is the one that allows them to use the micro as a chess partner.

In a more serious vein the venturers use the Electron to learn and practice morse code and for touchtyping self-tuition.

The Sir Walter Raleigh is currently anchored near the Great Barrier Reef where marine archaeologists from the Queensland Museum are diving to retrieve relics from a

Scouts troop runs on an Electron

SCOUT troop leader Dave Beckingham has good reason to be grateful for his daughter's Electron.

Borrowing the machine means he can spend one night a week less on his paperwork.

Keeping records is a major part of running the 1st Knutsford Scout Troop in Cheshire.

At any one time there are more than 20 boys aged 11 to 16 in pursuit of four different progress badges, each of which requires the completion of up to 18 items before it can be awarded.

In addition the same boys could be chasing any of the 80 or so proficiency badges open to them.

Keeping tabs on where each boy stands in the various categories could be a massive adminstrative headache for Dave if he didn't have the Electron.

"I used to spend half my time filling in little bits of paper, then trying to find them afterwards", he told Electron User.

"Now I have a complete up-to-date record on disc of what each boy has achieved and when he earned his qualifications.

"I'm thinking of extending the system to include records for the cubs also. And it's even portable – I can take the Electron and disc files to troop meetings and run the machine off a 12 volt car battery!"

Stand that says Thanks

WHEN tubular steel furniture manufacturers Roland Davies and Howard Bevan decided to produce their first computer workstation they chose an Electron to build it around.

It might seem an unusual selection, given the choice of any number of more celebrated machines, but the explanation is quite simple.

As Roland Davies says: "I've had an Electron myself for three years and it really



got me interested in computing.

"Designing our MicroDesk with the Electron in mind was partly a way of saying thank you for all the pleasure the machine has given me.

"My Electron cost me nearly £200 - a vast sum compared to recent prices - but it has been worth every penny, both at home and in the office.

"I've written games and business accounting programs on it, and despite having been back and forward between my house and office like a yo-yo it has never let me down.

"Naturally I've upgraded the machine since my early computing days. I now have a Plus 1 expansion unit, a Quill utility for writing adventure games and a Turbo for increased speed.

"Our MicroDesk has been designed to provide plenty of space for a monitor, keyboard, cassette recorder or disc drive, printer and software – and at the same time leave enough room for your book and workpad.

"And because it is built to the same standards as our tubular steel contract furniture, it offers a level of quality and construction suitable for school or office as well as home use".

MicroDesk, from Davies & Bevan Furniture, costs £38.95.

Santa was really big attraction

FATHER Christmas's decision to go online for the festive season proved a major attraction for the kids – even for some rather big ones.

What else could account for the electronic requests for Porsches, pay rises, Swedish au pairs and Page Three girls which flooded into the North Pole?

Yet another first for Micro-Link, the UK's leading electronic mail service, SantaLink attracted some 1,000 messages in the first week alone.

And of these more than one

third are believed to have come from adults.

With Santa hooked up to the giant MicroLink central computer, all that was needed to contact him was any home or office micro.

"The response was quite incredible", says Derek Meakin, head of MicroLink. "It seems that adults enjoy sending messages to Father Christmas just as much as children do.

"Mind you, what he made of some of the more grown-up requests is beyond me . . ."

RALEIGH

From Page 5

200-year-old ship lying 110 ft beneath the waves.

The wreck is that of HMS Pandora, sent by the Admiralty in 1779 to capture and bring back the Bounty mutineers to stand trial.

The divers themselves also need light entertainment when the day's work ends, so once again the Electrons play their part in the social life of the ship.

Back home, Operation Raleigh is coordinated from centres in London, Leeds and Hull.

One of the present tasks of the computer development workshop in Hull is to create a system for an Electron – currently used for training – to display a commentary on a series of projected slides.

Learning on the

THREE new learning programs for the Electron have been released by HS Software.

Entertaining English is a two program pack teaching language skills to children between 7 and 11.

The first part, Timeslip, displays sentences containing present tense verbs. A rocket collects each verb and travels back in time to an eerie cave.

The player then has to choose the past form of the verb and return to the present with it while avoiding a caveman and manic pterodactyl on the way.

The second part, Busy, performs a range of actions on the screen against a scrolling background.

The player has to type in a verb – at the higher skill level an adverb as well – to describe each of the actions

Electron

shown.

If the child describes all the actions successfully they are replayed in sequence to a musical accompaniment with each description highlighted on the screen. Price £7.95.

Adventurous English is a game that helps children to develop grammar and language skills in an entertaining way.

Children gain an understanding of prepositions and develop their problem-solving skills by helping Ben discover treasures and avoid hazards on his dangerous journey. The price is £5.95.

Reading Pack 2a, for ages six to nine, is the latest addition to the Read-Right-Away series and contains two new games to boost reading skills.

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Electron User, June '86

"The AP4 should be considered the standard interface for the Electron" Acorn User, July '86

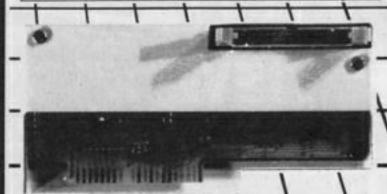
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AMX PACKAGE

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Included in the package are two superb programs:

AMX ART has to be seen to be believed! It's a computer-aided drawing program that's just as good for serious applications - such as the preparation of detailed architectural and engineering drawings or teachers' worksheets - as it is for having lots of family fun! And if you're artistically inclined, you'll be astonished at the quality of work you can produce and save. It makes full use of on-screen menus, pull-down menus and icons: the ideal, easy way for novices to learn and gain in confidence.

ICON DESIGNER is an invaluable program for creating and storing icons for use in your OWN programs.

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BASIC) to run from verify two non-standard discs. disc based software. A.C.P. also supplies 51/4" ("ADI features an extremely comprehensive SWays ROM/RAM, execute specific disc drives to add to your Plus 3 (inc. 2nd. sector editor, and one of the finest I've seen' machine code subroutine in a ROM, generate drive adaptor). "ACP has produced another ... Tublink on Prestel) a ROM's checksum & CRC. (supplied on 16K EPROM + manual) superb ROM for the Electron".. Electron User *Representing amazing value for money. Go Feb '86 out and buy this real bargain," E.U Dec '86 (supplied on 16K EPROM + DFS MANUAL) **ADVANCED 1770 DFS ADVANCED PLUS 4 ADVANCED PLUS 5** 3 versions ADM (11) - ADB (12) (08) /E+1/ £79.98 (09) /E+1/ £66.70 ADE (13) 'Disc drive compatibility at long last' A triple interface cartridge providing... Electron User June '86. 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I can recommend it to Also contains 2/3 ROM sockets and on board *An excellent buy for users with a 1770 Disc ... Electron User, June '86. anyone operating software for 2nd processor. AP4 packages + D/Drive, AP4 100/AP4 400 controller" M.U Dec'86 ADVANCED ELECTRON DFS Eee *OTHER PRODUCTS & SPECIAL OFFERS* £19.99 (14) /E+ASR/ An alternative to our AED(05) for Plus 3 and VIEW cartridge (101) /E+1/ £12.95 31/2" discs10/1/box(120) /M/B/E/ £24.00 ASR users. This optional alternative DFS is (102)/E+1/ £12.95 51/4" discs ds/dd "(121) /M/B/E/ £12.99 designed for use in Sideways RAM (ASR) and VIEW & VSHEET (119) /E+1/ /M/B/E/ £ 8.99 £19.00 51/4" discs ss/sd (122) allows the user to operate a disc filing system £129.00 &Epp when using the Plus 3 (in ADFS page LISP cartridge (103)/E+1/ £ 9.99 31/2" disc drives (125) £159.00 E/Adv User Guide(104) /E/ £ 3.95 51/4" disc drives (126)would normally be &1 Dee). 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Hitch your wagon to a Blazing Star

THE festive season is now upon us and hopefully Santa has brought you the goodies you asked for.

This is also the period when software houses - like record companies - swamp the market with their most commercial (and sometimes their best) offerings.

Robico's Blazing Star should be bulging from a few stockings. If you haven't yet got it I really must recommend

If you have seen either Ghost Town or Pony Express, Blazing Star is in that vein but ten times better.

Any of you who have played Magus' What's Eeyore's or Locks of Luck - or better still seen Village of Lost Souls on a friend's BBC Micro - will realise what a marvellous adventure house it is.

However, news has it that they are thinking of pulling out of the Electron market because of lack of demand.

It is a small company which

can't afford large national adverts. I would therefore suggest that unless you want to see another super producer of adventures disappear from the Electron scene, you should write to them to prove where the market is.

The address is: Magus, 4 Toronto Close, Durrington, Worthing, West Sussex. BN13 2TD.

Meanwhile at Melbourne House, Trevor Lever and Peter Jones have penned another spoof adventure called Dodgy Geezers. To date it is only available for the Commodore let's hope an Electron conversion is forthcoming soon.

I have recently been sent a copy of Adventure Soft (UK) Scott Adams Hint book. At £2.99 it is a bargain and a must for any adventure fan.

Adventure Soft (UK) formerly Adventure International - has also informed me that all 30 of its adventures. including 10 budget price titles, are now available for the

Electron.

The most recent text adventure, Rebel Planet, is riveting. The new address is: Adventure Soft (UK), P.O. Box 786, Sutton Coldfield, West Midlands, B75 7SL.

Christmas is a wonderful time, even for Saxon kings such as I. I always feel humble at this time of year. Mind you, the quality of letters I am continually receiving from readers makes me feel quite servile for most of the year!

But letters such as those sent in by Graham Thompson banish that humility and make me comprehensively noble again.

He has an admirable habit of beginning his letters, "My Lord Pendragon," and signing off, "Pleb to the Court of King Arthur". It's refreshing to know that some subjects still know their place.

I have yet to receive a full solution to Philosopher's Quest, as requested last month. Don't forget there's a copy of Robico's Myorem waiting for the first solution I pull from my mail bag.

I've had to employ four more ravens this month to deal with all the outgoing mail.

As long as Galahad and Gawain don't ask for a Christmas bonus or something silly like a Holy Grail, I should clear the backlog soon.

Don't let that put you off writing in. I'm always pleased to read your letters, but if you have asked for a full solution to an adventure, please be patient.

I have already been inundated with names of adventures and their publishing companies. The database I am creating now contains more than 300 adventures available for the Electron.

Please keep sending in names of any obscure software house which publishes adventures for the Electron, but don't forget to include: Name of adventure and name and address of software house - Thanks!

Perhaps the most amusing letter I have read since I moved into the cave was sent by a Newcastle fireman, Austin Baird.

Apart from threatening to throw his Electron at the next passing cat, he makes a plea for help in this column to be specific rather than cryptic.

I will try to oblige, Austin. I will add that I don't think you are a "Sub-human cretin" - a tremendous number of people

KNIGHTS OF THE ROUND TABLE

adventures. If you write to them please enclose an sae.

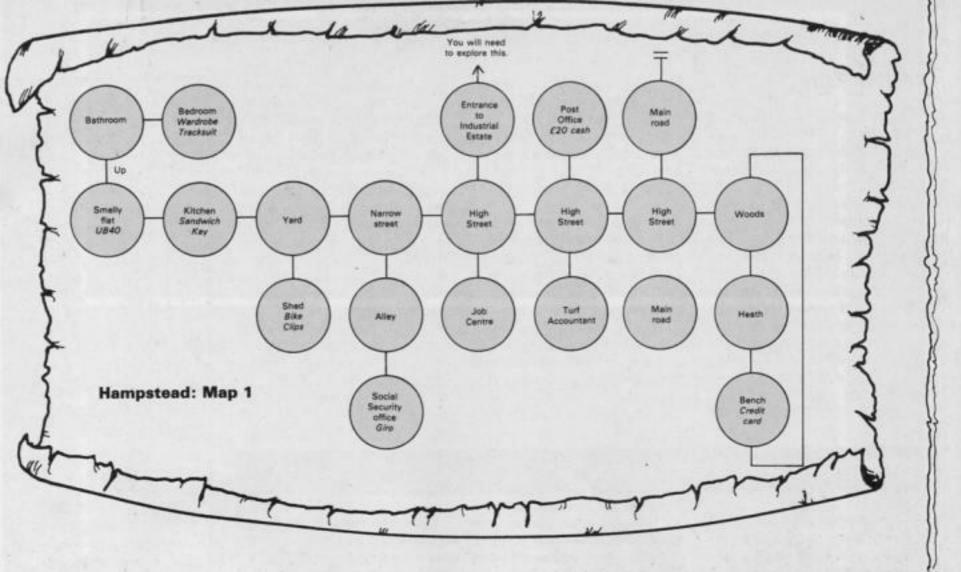
Kneel and rise: Sir P. Shackels of 29 Grosvener Gardens, Southgate, London N14 4TU who offers help with Hampstead, Gremlins, The Count, Twin Kingdom Valley, Spiderman, Terrormolinos, Stranded, Crown Jewels,

This section is devoted to Castle of Riddles, Ring of Arkyrz, Crown Jewels, The readers who have offered Time, Dracula Island, Sphinx Count, Pettigrews Diary, specific help with a number of Adventure, Voodoo Castle, Galilee, Gold Baton, Circus, Ten Little Indians, Arrow of Death and Gold Baton.

Sir John Tipper of, 7 Main Street, Newbold Verdon, Leicestershire LE9 9NL who can help with 23 adventures -Sphinx Adventure, Twin Kingdom Valley, Hampstead, Terrormolinos, Pirate Adventure, Wheel of Fortune, Wizard

Woodbury End, Ten Little Indians, Mystery Fun House, Adventure, Classic Adventure, Adventureland, Castle of Riddles, Philosopher's Quest (How about sending me a solution!), and Arrow of Death parts 1 and 2.

Don't forget to give a full description of your problem.



PROBLEMS SOLVED

Despite the reams of help given by Merlin for Sphinx Adventure — including a Special and a full solution in Hall of Fame — I still receive many letters from readers who are experiencing problems.

So, for Debbie Dell, Daniel Gilbert, Martin Forrer, Frances Atkinson, W.A. Smith and hundreds of others, this short

listing may help.

It was kindly sent in by Simon Doyle of Taunton and enables you to program the function keys. It should be entered and run before chaining Sphinx. You can change the commands to suit your own needs.

18 REM DEFINED KEYS
28 REM FOR ACORNSOFT'S

38 REM SPHINE ADVENTURE

48 REM BY SIMON DOYLE 58 *KEYL*60 NORTHIM*

68 *KEY2"80 SOUTHIM"
78 *KEY3"80 EASTIM"

BB *KEY4"60 WESTIM"

90 *KEY5"TAKE "
188 *KEY6"KILL DWARFIM"

118 *KEY7"NO:N" 128 *KEY8"AXEIM"

138 +KEY9"GET AXEIM"

148 *KEY8"INVENTORY:N"

158 CHAIN "SPHINX"

While on the subject of Sphinx, there are only four locations in the Catacombs Frances, so drop things to help you map them.

Since its re-release on a budget label Twin Kingdom Valley appears to have shot up the popularity stakes again – if it ever left them.

Luke Adams, Stuart Kelly and Helen Knight have all asked where they can find the jug of gold. You should take the jug from the cabin and fill it at the River of Gold, which is beyond the rock fall in the sloping maze.

The treasure chest is in the south turret of the castle, Stuart.

Stuart Kelly and many others seem puzzled as to how to deal with the numerous creatures you meet in your journey through Twin Kingdom Valley.

Elves are always friendly, as is the giant who will carry things for you. Live and let live is a good maxim, but if they are carrying treasure you will have to bash them.

The most potent weapons are the mace, axe and sword, but save the wooden staff for dragons and witches.

Richard Milligan is having problems with the Forest King. Take him the big diamond – you can pinch it back later – wear the amulet and rescue his daughter to be rewarded with a silver key.

Compared to Ken Brown's dilemma (do you play golf, Ken?) most other readers' problems seem quite trivial. Ken is threatening an odd form of suicide using his version of Hampstead unless I help him finish this adventure.

To win myself a life-saving certificate, here goes:

Satisfy Chubby Fish as I hinted in last month's column then: N - GET CAR - N - W - S - S - S - DROP CAR - W - DROP SUIT - GET TRACKSUIT - WEAR TRACKSUIT - E - GET CLIPS - WEAR CLIPS - GET BIKE - RIDE BIKE - N - N - E - E.

I hope that's not too cryptic for you, Austin! I also hope that I have helped Jonathan Ewing (any relation?) and many other readers who were stuck at the end of this adventure.

I would like to thank Mr W.E. Trevelyan for his most informative and helpful letters, particularly his help with Woodbury End and The Ferryman Awaits.

For those of you who have experienced problems with the save/load facility in Woodbury End, he has sent me an excellent listing to overcome this hassle. I'll print it next month in this column. If you send me a list of your adventures, Mr Trevelyan, I'll return a top piece of software to you.

It certainly seems to be the month for listings. Nigel Kershaw has sent this super little cheat for all Adventure Soft games: Load the adventure as normal then quit and press NO when it asks if you want another game. Then type the following four-liner:

1 VDU 14

2 FOR X=&E80 TO &FFFF

3 IF ?X>31 AND ?X<127 THEN PRINT CHR\$?X;

4 NEXT

Hey Prestol Use Shift to scroll and see for yourself.

Finally, if anyone requires a full solution to Woodbury End or Stolen Lamp, please send an sae.

From Page 11

find adventures difficult to begin with.

J.Keighley has written in to say that he has completed Sphinx Adventure in 299 moves. Well done Mr Keighley – can anyone better that?

I would like to thank Ben Hughes of Hereford College of Art & Design for the superb graphic letter-heading he sent me. Thanks, too, to Sheila Beattie and Matthew Pyecroft for their mass of ideas for this column. I will consider them all and may even use a few watch this space.

You will notice this month

that the Lords of Adventure box has disappeared. Don't fret, it has simply been replaced by Knights of the Round Table - after all, we all end up going round in circles trying to solve these adventures.

A large number of readers have asked for help in mapping adventures. I have produced an adventure mapping grid which some readers may have already seen.

If you would like more details on how to obtain one of these grids, write to me, but don't forget to enclose an sae. Also watch my Beginners' section for more specific help in future issues.

I will also try to continue Merlin's habit of producing a map of a small part of an adventure each month.

As you can see, this month I begin with Hampstead, and you'll also find the following hints helpful:

- You ought to wear some-
- A UB40 isn't a pop group in this instance but a means of getting money.
- Don't risk spoiling your tracksuit with bicycle oil!
- Don't fritter your money away.
- A rest on a bench will do you good!

OVERTURE AND BEGINNERS

Last month I introduced this section by suggesting some things to look out for when buying your first adventure. This month I shall try to offer help now you have got that

It perhaps sounds obvious but we all often miss the obvious - read the inlay card or enclosed information carefully

They often give vital information or important help to get you started.

For instance, the small card enclosed with Adventure Soft's Voodoo Castle is priceless to the novice adventurer.

It tells you to set page to &E00 before chaining the

This is especially important inroads into the game. if you have a Plus 1 or DFS fitted and want to avoid the nuisance of waiting five minutes before discovering a Bad mode or No room message.

The card also informs you that the adventure only accepts one or two word input usually in the form of verb-noun.

And it lists a sample of the prized piece of software home. vocabulary: Go, Take, Drop, Climb, Enter, Leave, Move, Quit, Wear, Read, Light, Pull, Push and Look.

Wave, Dig, Mix and Drink before loading your adventure. are other useful words which are worth trying.

My usual practice with any new adventure is to load it and then spend up to an hour just playing around, discovering opening locations and experimenting with vocabulary.

I do this purely to get the feel of the adventure and at this point make no attempts at mapping or making serious

So with Voodoo Castle it soon becomes apparent that there is a coffin and the body of Count Cristo at the starting location and that magic is workable in this adventure.

Thus when you discover a sapphire ring and later a stone door with a sapphire set into it there appears to be an obvious magical link.

After a bit of examination and experimentation, WAVE RING reveals an interesting variation on OPEN SESAME.

Such is a typical example of problem solving in a simple adventure like Voodoo Castle.

Further exploration reveals all manner of magical apparatus - an iron pot of witch's brew, chem tubes, chemicals, a rabbit's foot, a four leaf clover and so on.

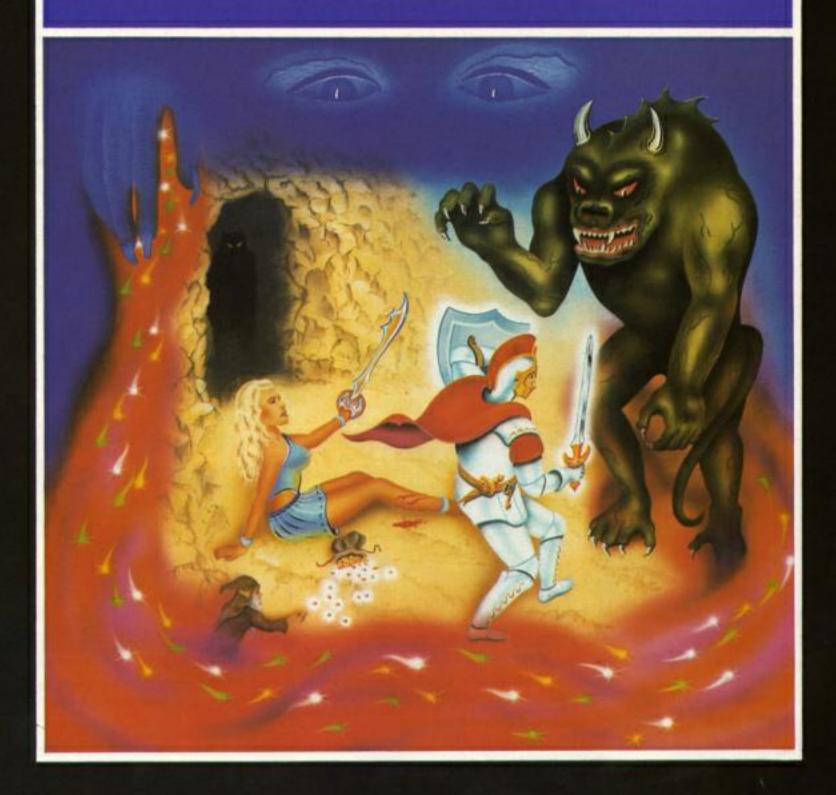
Most problems can be solved by careful experimentation with the objects and workable vocabulary.

If you are still desperate most adventure software houses provide hint sheets in return for an sae. Or you can always try writing to me.

Next month I will look at beginning to map an adventure.



THE ADVENTURE CREATOR



The HIGHLY ACCLAIMED Adventure generating system is now available for the Electron computer. You can create your own professional 'stand alone' adventure games with The Adventure Creator. The intelligent command interpreter can handle complex sentences and multiple input commands in your own adventures. Extensive text compression allows you to produce more numerous and detailed location descriptions.

Some of the many features include a full function editor, automatic word formatting, a logical command interpreter and an abbreviated input acceptance facility.

An EXTRA feature, added specially for the Electron Adventure Creator, is the additional command'chain' that allows you should you so wish, to create MASSIVE multi part adventures.

Unleash the power of your imagination now! The Adventure Creator for your Electron or BBC. Available from all leading retailers or direct from Incentive on (07356) 77288.

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TO ORDER TURN TO THE FORM ON PAGE 53

Nasties in the cavern

Program: Thunderstruck II (The

Mindmaster) Price: £7.95

Supplier: Audiogenic, PO Box 88,

Reading, Berks. Tel: 0734 303663

AS Thunderstruck II loads you are left watching quite a well drawn title screen, which is rather a blessing as it takes around seven minutes. However, your patience will be rewarded as the game is well worth waiting

In this arcade adventure you start complete with spacesuit and helmet in an underground cavern. You are immediately required to dodge the advances of something that bears a close resemblance to a berserk helicopter.

You then make your way through the various screens which present you with a whole host of evil nasties, all intent on reducing your life expectancy.

Your current state of health is shown on screen. If it falls to zero you will be whisked right back to the underground cavern as you only have the one life.

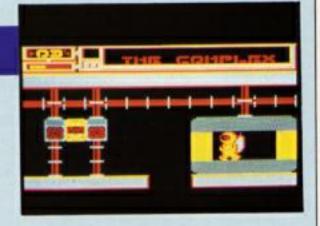
As you pass through the various rooms you will discover a number of items which can be picked up and used elsewhere to further your travels.

The problem that you have to work out is where, how and when each of the items should be used. And to add to your problems you are only allowed to carry one item at a time.

A score is shown on screen which represents your percentage achievement to date - mine remained depressingly low.

Approximately two thirds of the screen is used as the game area - the remainder is used for memory storage. This area does remain blank so you are not distracted by rippling colours.

The graphics are excellent with big chunky sprites and very smooth movement. The sound effects were adequate but they could have been a little more imaginative. However, there is a facility to turn them off if they become too annoying.



My only reservation is whether the game may pall a little once all the problems are solved, but in my case that could take forever anyway. The game does use rather a lot of memory so Plus 1 and Plus 3 owners should ensure that these are disabled before this program is loaded.

I found the game extremely addictive and while it comes from the same software house that brought us Bug Eyes II, which has a similar style of graphics, I found this to be the more Beejay entertaining of the two.

Sound	6
Graphics	
Playability	
Value for money	8
Overall	8

A castle with style

Program: Ravenskull

Price: £9.95

Supplier: Superior Software, Regent House, Skinner Lane, Leeds LS7 1AX.

Tel: 0532 459453

THE evil Baron Strieg has stolen the silver crucifix. Without its protection the village of Austburg is powerless against the zombies which inhabit the local swamp.

To save the village you must enter Ravenskull castle and locate the four parts of the crucifix.

Before starting this arcade adventure you select whether you are to be an elf, wizard, warrior, or just an ordinary run-of-the-mill adventurer.

This appears to determine what sort of treasure you collect as you explore the castle. Wizards collect crystal balls, warriors get shields, and so on.

The screen display is divided into two main areas. The first is the status section, which shows your score, health rating, number of lives and what you are carrying.

The rest of the screen forms a large window into the castle and you are treated to an aerial view of yourself and your immediate surroundings.

As you walk in one of the four possible directions the screen scrolls smoothly in that direction revealing more of the castle. The graphics used are some of the best I have seen on the Electron.

The playing area is 64 times the size of the action window.

There are four levels to the castle with one quarter of the crucifix hidden in each and you can only pick up a piece of crucifix when you have collected every item of treasure on that level.

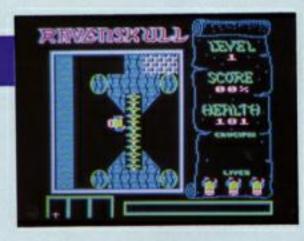
As you might expect the castle is constructed like a giant maze, with sections closed off by different types of door.

Some of these can be opened using keys, but although they all look the same each one will only open one specific door.

Every time you play the game the objects are in the same position so you quickly learn where to find them.

Apart from keys you will find magic scrolls and potions which will give you special powers - or poison you!

Some of the castle's nastier



residents are the ravenbees. These follow specific routes along some of the corridors, and you will need split second timing to avoid these little beauties.

I loved Ravenskull - there is a genuine feeling of satisfaction when you guess the correct use for an object or gain access to a new section of the castle.

The puzzles are devious and the correct route is not always obvious but you know instinctively when you're on the right trail.

Steve Brook

Sound	4
Graphics	9
Playability	9
Value for money	9
Overall	9



BATTLE ZONE SIX

Play the most hectic battle of your life in the ultimate Zap game!

The myriad of aliens use virtually every screen movement imaginable, all with one purpose - to get you!

And would you believe 100 - yes, 100 different screens. Never before achieved.

Base and firing control in eight directions. Pause control to enable saving to tape. Shield control. Sound on/off. Speed

One of our best ever and sure to be a real winner. To be released at £7.95.

Pre-release offer at just £4.95

WORD PROCESSOR

This is the one designed for the two finger typist and has received rave notices over the past two years. It allows continuous typing, with no need to look at the screen, with line ends, margins and everything else automatically sorted out at the printing stage by the Embedded Control Characters - as used by professional word processors.

You can automatically move left margin, decrease characters per line, centre text, right flush, new line, new paragraphs, new page, underline, and enlarged, emphasised and condensed characters.

All main controls toggle on the function keys, which are: Add, Edit, Search, Replace, Save text, Load text, Inform, Exit processor, Enter processor, Delete text, Insert buffer, Clear buffer, Format.

It will do many other things, printing either continuous or single sheets, emphasised or draft copy, double or single spacing, adjustable page length and optional page numbering. Editing and insertion is simplicity itself and a buffer allows 255 characters to be moved anywhere.

Complete with extensive User Guide giving actual examples.

Catalogue price £22.50. Sale price £9.95

MICROTYPE

Now firmly established as the 'standard' typing tutor for the BBC and is now used in over 200 colleges and schools and in training by ICI, NCB. Shell, Boots, Post Office, British Telecom, etc.

The program gives both exercises and sentences with a complete analysis of your average typing speed, accuracy and the keys mis-typed. If you wish to master the computer keyboard, then this is the program for you. You will benefit even after the first lesson!

Catalogue price £12.50 Sale price £5.95

We operate a first class return post service, whether payment is made by cheque or credit card. Telephone orders by Access, Berclaycard or Diners before 4pm will be in our private collection at 4.30 If a program fails, no matter how caused, it will be replaced absolutely free of charge, this year, next years or in ten years...

So though the cowboys are deserting the Electron fast, Kansas will most certainly be herel

PRICES INCLUDE VAT AND POST Nothing extra to pay!

Top games at £3.95 each!

"Ten out of ten for value" - Electron User

The new Arcade from Kansas—a four in one game with four entirely different and active, colourful screens. Drive the Loco, switching lines, firing harpoons and smoke to evade the rockets and planes. Then get to the buffet car by jumping the gaps and avoiding the cannon balls and arrows. If you make it, then it will be all out catching the spinning cups from the three tables. Then as you come to a standstill, in the last screen you have to find out how to release the brakes.

Catalogue price £8.50

An ultra active arcade game which outsold everything when on display at the last Micro User exhibition. Needs no small amount of skill to get past the first level and there are seven of them! Manipulate the Buggy three different ways as the ground speeds by and at the same time use the different firing directions to splat or jump the many obstacles. There are craters, boulders, debris, mines, tanks and bridge traps. Spacecraft and rockets all add to the excitement. This is a very challenging one, with single hazards, multiple hazards and even combination hazards. Multiple scenes with fast fluid action.

PINBALL ARCADE

Catalogue price £10.35

The only game ever to achieve FIVE five star reviews in the Press! Now faithfully converted to the Electron, with all the original SBC features, and running at the correct speed. Build your own pinball tables from the many bumbers, targets, slings, etc., from the six pages of colourful shapes, moving or re-moving anywhere on the board. Adjust tilt, bounce and even alter the scores. A most realistic spring action and even the strength of the flippers are adjustable. After a board as been created, it can be saved to tape, played and even altered again.

THE FERRYMAN AWAITS

There's never been anything like it before! An entirely new computer language—
TOC—has resulted in cramming a virtual 60K Adventure into the normal Electron!
Devised by the programmer, this has resulted in the most involved and devious
Adventure ever to appear on the Electron, with literally around half a screen of
text depicting each location and objects. Hundreds of real locations and countless
objects and things take the adventurer onto a totally different plane.
It is the only Adventure to accept more than a two word command. Such as TAKE
SKULL FROM SHELF OPEN DOOR is quite acceptable! It will even accept multiple
commands. Set in the future, it is a magical quest in a wasteland populated only
by fanactical devil worshippers and savage pirate hords, to which you are sold
as sacrifice. Do not expect to complete this Adventure in a few evenings, it will
take a long, long time. And you will need our Helpl service...

Any THREE below for £7.50

Catalogue price £8.50

A true cockpit view of both the runway during take-offs and landings, and the enemy fighters which have to be blasted out of the sky. Graphics include an accurate radar system and a combined artificial horizon and turn and bank indicator. Information shown on fuel, speed, rate of climb, aftitude and score. As the fuel gets low, you can switch to approach, land, re-fuel and take off again.

Catalogue price £9.50 Take the barrow down the lift into the many galleries of the mine, first to dig for diamonds and then for gold. Astute use of the lift and ladders and you might escape the monsters—or lead them to their destruction. Then go down for coal to re-fuel the furnace, which depletes as you use energy for the lift.

MANIAC MOWER

Catalogue price £8.50

Try to mow the grass in the park whilst avoiding the maniac mower, whose only aim is to cut you up! To make it harder there are lots of nasties lurking in the grass—all out to get you. To make it harder still there is a karate expert training in the park, who is very unfriendly indeed!

Catalogue price £9,95

Played by one, two or four players. Harlequin is a very different sort of game—treasure hunting on the computer! Try to find which of the 14 treasure places the treasure is hidden, using the given clues. In addition to the information, there are lots of different tunes, very well done, with plenty of colour.

UNCHMAN

Catalogue price £8.50

This is the one that started it all—a real live 'Packman' for the Electron. It is just like the original Arcade game with ghosties chasing you around as you devour, with all the facilities of the energisers which give limited time to zap the ghosties.

Catalogue price £7.50

Seven hectic levels with split screen and even double split screen make this very active indeed. The snake gets longer as the mushrooms are devoured, but avoid the toadstools at all costs. Ideal for young children, whilst by increasing the speed, active for adults and experts too.

REVERSI

Catalogue price £7.50

The Electron as your partner at Reversi-also known as Othello. Plays to all the rules with accepted black and white counters on a green board. Moves easily entered with very quick responses. All information and scores on the screen.

Catalogue price £9.50

This Adventure has started countless people on adventures and provided a great deal of pleasure. The aim is to find and kill Count Dracula before he gets you. It is an ideal starter, needing plenty of effort to solve but not being too difficult to finish. Like all Kansas adventures, it is totally logical, which means things are always in the same place or where you leave them. Also like every Kansas adventure it has a game saving facility. And if you really get stuck, don't throw it away in disgust—give us a ring, for we operate a telephone Help? service

RING OF TIME

Catalogue price £9,50

The sequel to Dracula, this is a little harder to solve, though still retaining all the features, including the split screen, which means the important information remains on the screen all the time. The object is to retrieve the elusive Ring of Time, going through many trials and tribulations.

REVENGE OF ZOR

Catalogue price £9,50

The long awaited sequel to Dracula and Ring of Time. Somewhat more difficult in this Adventure you have to escape the vortex and the revenge of the evil Zor. This is a natural progression, and the adventurer will find the programmer has become much more devious, thus requiring greater effort to solve.

Kansas City Systems, Unit 3, Sutton Springs Wood, Chesterfield, S44 5XF. Tel. 0246 850357

Football for fanatics

Program: Goall Price: £6.95

Supplier: Tynesoft, Unit 3, Addison Industrial Estate, Blaydon, Tyne &

Wear NE21 4TE. Tel: 091-414 4611

FOOTBALL relies on several individuals working together as a team, which is one of the main reasons why programmers find the game very difficult to reproduce on the computer screen.

Every football simulation I have ever played involves the player controlling one footballer and trying to score against a computer that knows exactly where you are going.

This program does nothing to break this tradition - it is no worse than the opposition but it isn't any better either.

Goal! is a five-a-side game which is played over 90 minutes: Fortunately this isn't in real time.

I doubt whether there is anyone out there who could play this game for an hour and a half without suffering permanent brain damage.

The game is played on three separ-

ate screens. Kick off occurs in the centre circle and as the ball moves to either side of the screen the display changes to show one of the two goal areas.

This three screen system is one of the game's weak points. You may make a break with the ball and pass all four opposition players while still in the central screen.

As the screen is re-drawn to show the goalmouth you will find that the blighters are waiting for you in their own goal area.

You control the player who is closest to the ball. Occasionally he will be tackled and the ball will bounce towards one of your other men.

However, this new player will not respond to the controls until you press the kick key, so don't forget!

You can tackle a player by getting yourself on the same horizontal plane as the man with the ball and then running at him.

If you're lucky you will emerge from this clash with the ball at your feet. Pounding away at the kick key has very little bearing on the outcome of the encounter.

The computer controlled players all



move forwards together supporting the man with the ball.

Your players stand there like dummies as you race forwards. At least they reappear when you enter your opponent's goalmouth, not that they're much help.

The cassette inlay says that the computer team will adjust its level of play during the game to match your own. It never got down to my level!

If you are desperate to play football on your computer then this game is as good as any.

Steve Brook

Sound	7
Graphics	
Playability	5
Value for money	
Overall	6

Mazes to amaze

Program: Repton 3

Price: £9.95

Supplier: Superior Software, Regent House, Skinner Lane, Leeds LS7 1AX.

Tel: 0532 459453

JUST when you thought it was safe to go back down the mine Superior Software have released Repton 3.

The game features all the characters and graphics of Repton 2, but is closer to the original Repton in gameplay and objectives.

It comes with 24 challenging levels to complete, stored on tape as three separate files.

On successful completion of each level you are given the password for the next, which means that when you play the game on subsequent occasions you don't have to wade your way through it all again.

When playing the game only a small section of the overall map is visible at any one time.

Each level is laid out like a maze, constructed from boulders, earth, diamonds, giant eggs and many other devilish things.

To complete a level you must kill every monster and collect all the diamonds and a golden crown before a time bomb explodes.

The problems begin as you burrow your way beneath the boulders. As soon as the supporting earth has been removed the boulder falls, killing you or changing the shape of the maze by blocking off a passageway.

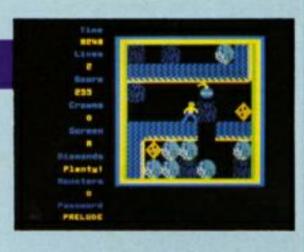
For this reason your route through the maze must be very carefully planned - one badly placed rock and you might as well start again.

As in Repton, you can call up a detailed map of the whole level to help you choose the correct path through a

When I first played the game I thought the monsters were pretty tricky to deal with as they have to be lured beneath a precariously balanced boulder and then squashed.

Worse than the monsters are the spirits, Will-o'-the-wisps which whizz along the pathways at incredible speed. You must lure them into cages, where they turn into diamonds.

As if 24 mind-bogglingly difficult screens weren't enough Superior



provides a screen designer too. This is a very classy piece of software which enables you to construct new screens in map form.

These can then be saved as data files and loaded by the main game. You could even challenge your friends to solve your latest devious masterpiece.

The game's graphics aren't the greatest I've ever seen but this minor niggle is soon forgotten as you wrap your mind around the puzzles. Repton 3 is a must for every Electron user.

James Riddell

Sound	5
Graphics	
Playability 10	
Value for money	
Overall	,

Collection to collect

Program: Computer Hits 3

Price: £9.95

Supplier: Beau Jolly, 29a Bell Street,

Reigate, Surrey RH2 7AD.

Tel: 07372 22003

COMPUTER Hits 3 is a compilation consisting of 10 games spread over two cassettes.

Tape one starts with Centibug where a segmented nasty dodges through the mushrooms intent on your destruction, while you and your laser attempt to serve him the same.

This is not one of the better versions of this game although it is fast enough to be a challenge. Graphics are smooth but the sound is unimaginative.

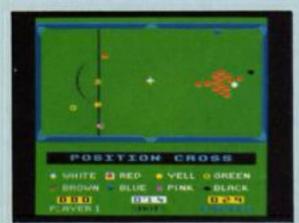
The next offering is Brian Jacks Superstar Challenge where you tackle the man himself in eight different events. Success is not dependent on pure key hammering but on your skill in manipulating the necessary keys.

Sound is almost non-existent but graphics are superb and rate a 9 in their own right. With events ranging from cycling to canoeing and from swimming to squat thrusts it could take some time to master. My only grouse is that events cannot be practiced but must be taken in order.

The third game is Snooker with options for one or two players and a choice of either 10 or 15 red balls.



Danger UXB



Snooker

Graphics are hard to fault and if two people have plenty of time and patience then it's great.

However, the game is slow and the movement of the balls is sometimes unrealistic. It should be noted that the one player option is not against the computer but one player taking all the shots.

I like Felix in the Factory, a ladders and levels game where your aim is to keep the generator topped up with oil despite the attentions of evil gremlins and a conveyor belt full of parcels to scramble over.

Graphics are great, sound is superb

– but why such a terrible choice of
keys? A for up and Z for down is quite
normal but P for left and the up and
down cursors for jump and right
respectively seems a strange choice.

Tape one ends with Danger UXB where you cross blocks to defuse the bombs. The blocks disappear as you move so watch the route you take or the next bomb is harder to reach. Gain extra points on the way by collecting the flags but avoid the skulls or you will lose a life.

On higher levels you have a reduced time limit to clear the screen, and you are harassed by a pair of animated Doc Marten boots intent on stamping you flat. Sound and graphics are excellent and the game is most addictive. One of my favourites.

Tape two opens with Alien Dropout, an invaders style game with the variation of mutant moths. These settle in boxes at the top of the screen allowing you to shoot them from below and only escape to attack you when a particular box is full.

This might have been addictive once upon a time but it looks very dated nowadays. There are six different skill levels but they do little except speed up the action.

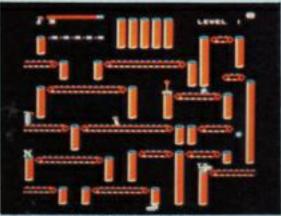
In the second game on this tape, Felix meets the Evil Weevils, our hero travels about his factory using aerosols against the mutating weevils



Stranded



Jungle Boy



Felix meets the Evil Weavils

and dodging ball bearings rolling down the chutes and conveyors. Excellent sound effects and nice chunky graphics give this game a very high rating.

The game Jungle Boy started life as Tarzan Boy and your task is to negotiate screens to rescue Jane. These screens are so packed with pitfalls and peril that the real Congo must seem tame by comparison.

There are cheetahs, rock dropping gorillas, a relative of Hissing Sid and, as a reminder of the original publishers, there's even a comparatively benign alligator. Colourful, well drawn graphics make this one of the best arcade games around.

In Mineshaft you move through screens of skeletal graphics collecting what are supposed to be lumps of coal while dodging various hazards. I've seen better games in magazine listings.

The last game is Stranded, a graphics adventure which starts with you stranded on a strange planet and looking for a way home. I have had this game in my collection since its original release and for anyone tempted to try a comparatively simple adventure game this is one of the best.

Despite the criticisms there are enough first class games on the two tapes to make this compilation very good value overall.

Beejay

Sound	6
Graphics	8
Playability	8
Value	
Overall	8

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DEALER ENQUIRIES WELCOME



Now let's put the turtle to work

LAST month I presented a turtle graphics compiler, which I hope you've entered by now. This time we'll look at Pogo – the language used – and see how to write simple programs.

Let me first say that it is not Logo, the language usually associated with turtle graphics, but it is very similar.

And it will give you a grounding in some of the structured programming techniques used.

When the compiler is run you'll see a start up message and the turtle – a triangle – in the middle of the screen. Pogo is now in immediate mode waiting for you to enter a command.

The first thing to do is type in a few commands and see their effect. Try:

CLS

There will be a slight delay as the command is compiled and then the compiled code is executed. The screen should clear and the turtle reappear.

The coordinates it uses are exactly the same as those used by Basic's MOVE and DRAW commands.

When the screen is cleared the turtle is moved to the centre of the screen – 640,512 – and its heading is set to 0 degrees – north. Now type:

FORWARD 288

and the turtle should go up the screen, draw a line and stop 200 screen units above where it started and:

RIGHT 98

will turn it through a right angle clockwise. Repeat the:

FORWARD 200 RIGHT 90

three more times and you should end up with a square.

Note that we've entered the same commands four times to draw the square. We can save a lot of typing using REPEAT. Enter:

CLS : REPEAT 4 [FORWARD 200 : RIGHT 90]

all on one line and press Return. You'll see the same square drawn again.

Within the square brackets following the REPEAT are the commands to repeat. The number immediately after REPEAT is the number of times to repeat them.

In our example FORWARD 200, RIGHT 90 will be repeated four times.

Even this can be tedious if you want to draw several squares so we can define a new word to do this:

TO SQUARE

tells Pogo that we're defining a new word called SQUARE and Pogo acknowledges by changing the MIKE PLUMMER concludes his introduction to Pogo

input prompt from - to @.

Next type in the actual definition:

```
CLS
REPEAT 4

[
FORWARD 200 : RIGHT 90
```

To end the definition we naturally type:

END

You have now defined a new word which will clear the screen and draw a square, and SQUARE is now part of the Pogo language. To see it in action enter:

SQUARE

Of course this only draws a square with a side of 200 units. What if we want to draw different sizes?

Like Basic procedures Pogo enables parameters to be passed to defined words, so we can tell SQUARE what size square to draw.

Get rid of the old version of SQUARE with:

FORGET SQUARE

and type in the new one:

```
TO SQUARE #side
CLS
REPEAT 4
[
FORWARD #side : RIGHT 98
]
END
```

This defines a word SQUARE with one parameter side. Note that parameter names and variables, as we'll see later, must start with a #.

You can now draw a small square with:

SQUARE 188

or a large one with:

SQUARE 488

Try defining a word to draw a rectangle. I'll start you off with:

TO RECTANGLE #L , #W

where L and W are the length and width. Test it with:

RECTANGLE 500 , 100

Unlike Basic all Pogo vari-

ables are integer and we need to declare them before referring to them.

MAKE is used to set up new variables and they can be used much as they would in Basic.

> MAKE #number #number = 180 PRINT #number

You can use any function that is available in Basic, although those like SIN and COS are not much use when using integers only.

Let's see how we can use such a variable. Type in the following, all on one line:

CLS : WHILE #number(508 [SQUARE #number : #number = #number + 100]

You should see a series of squares increasing in size. This example also introduces the WHILE/WEND loop.

The commands in square brackets are executed while the condition #number<500 is true.

This could be incor-

porated into a word definition:

TO MEGASQUARE

CLS

@number = 100

WHILE @number(500

[
SQUARE @number

@number = @number + 100

]

END

Now whenever Pogo comes across MEGASQUARE it will clear the screen and draw a set of squares. You can save the compiled code to tape or disc with:

SAVE Temp

which will save it under the name Temp. NEW will remove all of your defined words but they can be reloaded at any time with:

LOAD Temp

By now you should have a pretty good idea of how to

```
/# ----- #/
                               left 18
/* Enter PICTURE to run */
                               back 400
/+ ----- +/
                               gpos 440 , 112
                               right 98
to arc #len
                               forward 488
repeat 18
 forward #len
                             to leaves
 right 5
                               gpos 640 , 112
1
                               left 88
end
                               arc 35
                               right 130
to petal
                               arc 35
arc 28
                               right 60
right 130
                               arc 30
arc 28
                               right 130
                               arc 30
end
                             end
to flower
 repeat 13
                             to picture
                               hide : cls
                               flower : stem : leaves
 petal
 right 20
                               gpos 150 , 800
1
                               type "A flower by
                              courtesy of POGO"
end
                              bng
to stem
```

Program I: Picture

WORD	FUNCTION	The second of th	
ACCEPT #var		WORD	FUNCTION
CLS	The revulation the Keyboard	IF expr [words]	
OLO	cioui the screen and		The state of the s
PRINT #var	home turtle.		THEN execute all of the words in [].
rimer #var	Aditable on a	ELSE [words]	
PRINT 'text'	new line.		TALL DALL
THINK! TOXE	the text on a new	REPEAT expr [words]	[words] ELSE [words].
TYPE #var	line.	[words]	Execute the words expr
irc #var	the culterit post-	WHILE expr [words]	
TYPE "text"	tion.		Execute the words while
TIPE text	The Current posi-	FORGET word	expr is TRUE.
VDII	tion.	. Onder word	Remove all words after
VDU expr	Only one expression		and including the named
DACK	allowed.	LIST	word.
BACK expr		Lioi	List all defined words and
DOWN	Put the pen down.	NEW	variables.
FORWARD expr	Move turtle forward.	INCAN	Remove all defined words
GPOS expr, expr	Move the turtle to	SIZE	and variables.
unn	expr,expr.	SIZE	Print free memory and
HIDE	Do not draw the turtle.	EXEC filename	memory used.
LEFT expr	Turn the turtle anti-	EXEC mename	Take input from an Ascii
DIOLE	clockwise.	LOAD filename	file.
RIGHT expr	THE RESIDENCE OF THE PARTY OF T	SAVE filename	Load a program.
SHOW	- arr the tartie.	OAVE Mename	Save all defined words
UP	Lift the pen up.	SPOOL filename	and variables.
7	Print the turtle position		Spool output to file.
	and heading.	BREAK	Return to immediate
TO name	Define a new word,	OSCLI "text"	mode from any word.
	optional parameters.	OSCLI TEXT	Operating system com-
END	End a definition.	01117	mand.
MAKE #var	Declare an integer vari-		Return to Basic.
	able.		Comments, like rem
			statements.

Table I: Pogo reserved words – expr means a number, variable or an arithmetic expression, words is a list of words and var is a variable.

From Page 21

write Pogo programs. You'll find a complete list of commands in Table I along with a brief description of each.

These are Pogo's reserved words – that is, the ones provided by Pogo. Of course you can add to this list by defining your own as we've seen.

All input can be in upper or lower case. Pogo will convert everything to upper case except text between quotes.

All commands, whether defined or reserved words, must be separated by colons – except after a list of commands enclosed in square brackets.

Everything, including colons, must be separated by spaces. The only exception to this rule is when entering expressions in conditional or assignment statements.

Even the comment beginning and end markers /* and */ must be separated from the rest of the comment by spaces. If in doubt put a



space in, it won't do any harm.

So far you have typed in reserved words completely. In fact you only need to type in as much of that word as will identify it. Thus the reserved word BACK can be referred to by B, BA, BAC or BACK.

However, if there is more than one word which begins with the same characters, and if you only type these in, the first reserved word Pogo finds will be used.

I have chosen the order so that the more frequently used commands come first in the list. Thus the command given by typing in FO will be FORWARD and not FORGET, and E will become ELSE and not EXEC.

On the other hand defined words must always be typed in full. You can edit the input using the usual line editing commands with the Copy and Delete keys.

Once you've hit Return, that is it as far as editing the source code is concerned. If there is an error FORGET it and enter it again.

However, you can edit source code programs using View. To help in this respect you can spool what you type in at the keyboard into a file.

Press Escape to stop spooling. Load the file into View using READ. Alternatively you can create the source code in the first place using View.

Once you have created a source file in this way you can compile it using Pogo's EXEC command.

Good luck with your Pogo programming. If you are in any doubt about how to use a word have a look at the three Pogo listings accompanying this article – Picture, Pattern and Stargame. These use most if not all Pogo's vocabulary.

```
/# Enter PATTERN number #/
/# ----- #/
TO RECT #H , #L
REPEAT 2
 1
 FORWARD #H
  RIGHT 98
 FORWARD #L
 RIGHT 98
1
END
TO PATTERN ONUM
 CLS
 REPEAT 18
 RECT INUM , 200
  RIGHT 36
END
```

Program II: Pattern

```
/# ----- #/
/* Guessing Game */
/* Enter STARGAME */
to mode #num
 vdu 22 : vdu #num
end
to fancy
vdu 19 : vdu 1
vdu 7 : vdu 8
vdu 8 : vdu 8
vdu 19 : vdu 8
vdu 4 : vdu 8
vdu 8 : vdu 8
to wait #dummy
print " "
print * Press RETURN to
continue*
accept #dummy
end
to instruct
```

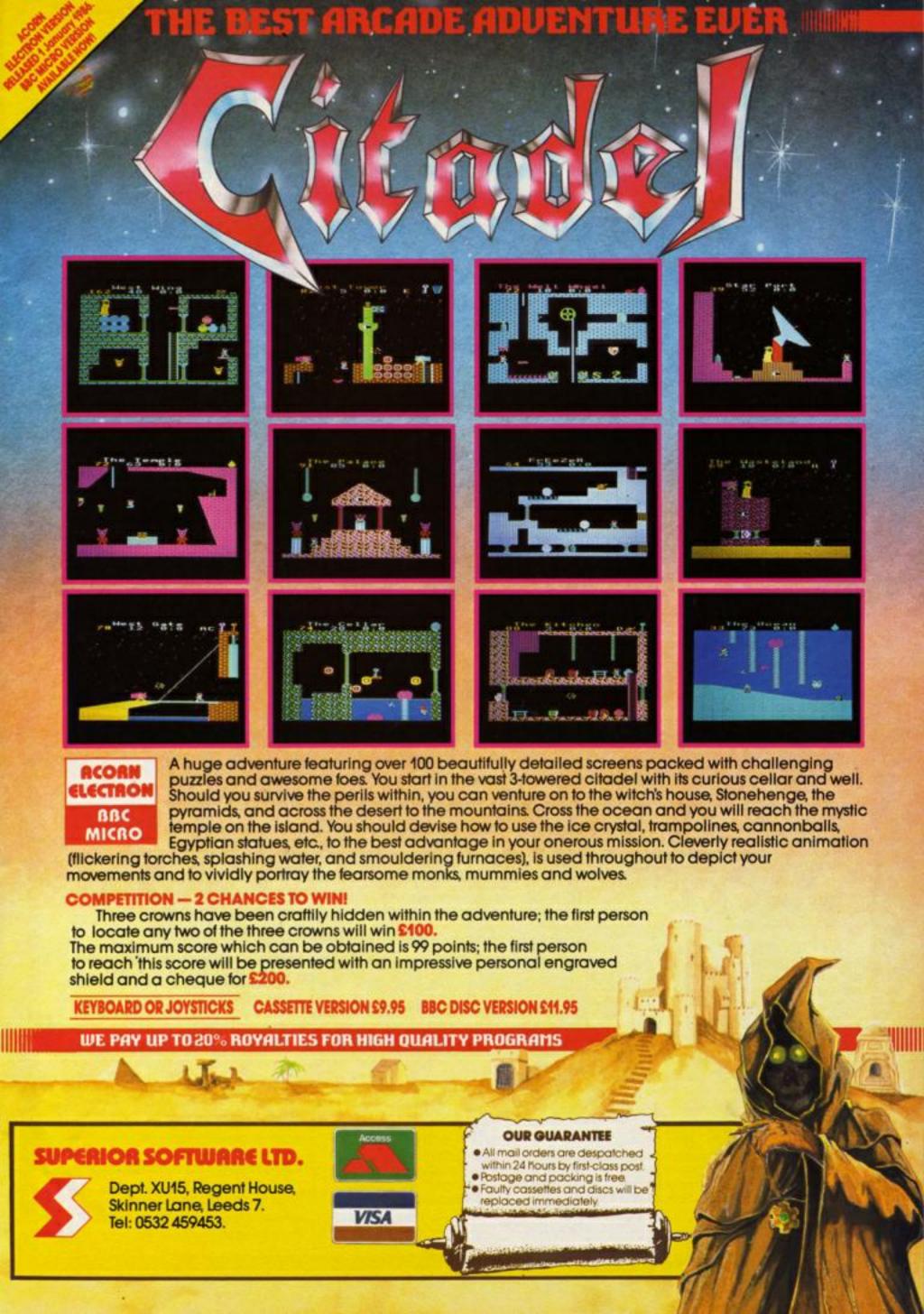
```
print . .
 print *
SUESS
print " "
print " Let us try a
simple guessing game."
print "The computer will
think of a number*
print "between 1 - 100.
You must guess what"
print "the number is.
Every time you try the"
print "computer will print
a number of stars"
print "on the screen, the
nearer you are, the"
print "more stars."
 print " Answer -1 to
finish."
 print " You are allowed
10 tries before you"
print "are gonged out.
GOOD LUCK !!!*
print " "
wait @
end
make tanswer
```

```
make #quess
to try #1c
print " "
print "Attempt number :-"
print #1c
 #guess = 1888
 while (#guess(1 or
#guess)100) and #guess()-1
  print "Guess a number
between 1 - 188*
 accept #guess
1
end
to display #1g
#lg = 8 / ( (
abs(#lg-#answer)/5) +1)
 print * *
repeat #1g [ vdu asc("#")
if (#answer()#guess) [
print "Sorry !!" ]
to stargame
```

instruct

```
while true [
 #count = 1
 #answer = rnd(188)+1
 while #count < 11 and
#answer()#guess
  try #count
  if #guess=-1 [ break ]
  display #quess
  #count = #count + 1
 if #quess()#answer
  print "The answer was "
  print #answer
  print "You are brilliant
  print
end
```

mode 6 : fancy



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HAVE you ever envied BBC Micro owners because they have Mode 7? Some of you may have already bought a Mode 7 adaptor – but for those of you who haven't, and at no cost to you, Electron User presents its own software version.

Before I continue I must stress that any BBC Micro programs you have which do not work on the Electron still won't work using this simulator.

However, those that do and make use of Mode 7 will be improved by the addition of proper Mode 7 double height characters and graphics.

To show how powerful this simulator is Figure I is a dump of a Mode 7 teletext screen display created on a BBC Micro, saved to disc and loaded into an Electron.

Program I shows the

- 18 REM Program I
- 28 MODE 7
- 38 INPUT "Filename: "scr\$
- 48 CLS
- 58 FX=OPENIN scr\$
- 68 FOR XX=1 TO 25+48-1
- 78 CX=BBET EFX
- 88 PRINT CHR\$(CI);
- 98 NEXT
- 100 CLOSE £8
- 118 SOTO 118

Program I

Go Mode 7 the software ROBIN NIXON shows how

ROBIN NIXON shows how it's done with the aid of this powerful simulator

routine used to load and display this and can be used for any saved Mode 7 screen.

An even tougher test would be to try and run a program that uses Mode 7.

Alien Invasion – published in the February 1984 issue of The Micro User – is the classic arcade game Space Invaders, written entirely in Mode 7 using teletext graphics.

The game runs on the Electron and produces quite a reasonable display. Figure II shows a dump of the game taken from an Electron.

The game does use illegal

methods to move the bombs – it tries to poke the Mode 7 screen directly – and this of course fails.

Please note that programs must use legal methods to create the display or the simulator will not work.

Mode 7 is completely different from the other seven modes and the programming techniques used are rather special.

I haven't the space here to fully explain all the teletext control codes — try and borrow a friend's manual for his BBC Micro — but here's a taster.

Double height text is produced by preceding the string with CHR\$(141) and printing it twice like:

PRINT CHR\$(141); "Hello" PRINT CHR\$(141); "Hello"

Lowercase characters can be replaced with graphics by preceding the string with CHR\$(145):

PRINT CHR\$(145); "abcde"

You can still print uppercase characters though.

Try experimenting and have a look at the listings in The Micro User as the games often have Mode 7 title screens.

The simulator is quite

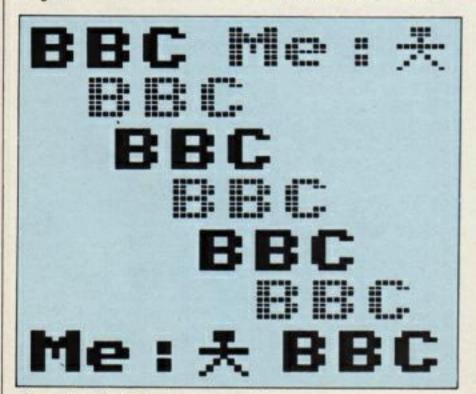


Figure I: A Mode 7 teletext screen display

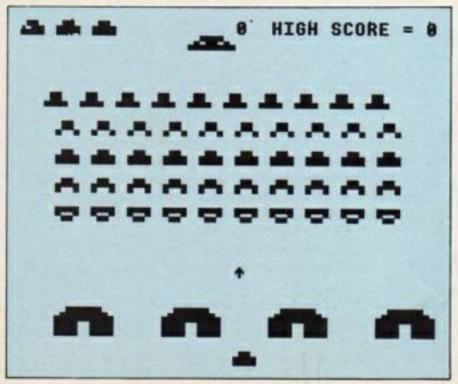


Figure II: Alien Invasion - Mode 7 Space Invaders

complex and again I haven't the space explain in detail how the program works.

Briefly though, the simulator works by interrupting the Electron when it changes mode.

If the new mode selected is 7 then the program will select Mode 4 and handle all output directed to the screen. Of course you can still use Mode 4 in the normal way.

The lower 25 lines of the Mode 4 screen become the new Mode 7 display. The top few lines are used as workspace and a dummy Mode 7 screen is stored here.

When characters are output to the screen they are stored in the dummy.

The program then looks at the dummy to see if there are any control codes to be taken into account before sending the characters to the new Mode 7 display.

The program could have been designed to use Mode 2 allowing all eight Mode 7 colours to be displayed.

However, this would involve totally redesigning the character set and would take up too much memory.

Many Mode 7 programs are quite long and simply wouldn't fit in the space left, particularly if you have a Plus 3.

So, although all text and graphics are printed correctly unfortunately they are only monochrome.

Enter and save the simulator. Before you run it PAGE must be greater than &1300 as the machine code is stored between &E00 and &1300.

Change PAGE and reload the program if necessary.

Plus 3 users will find that they can't use discs after running the program. If this is essential alter P% in line 170 so that the code is assembled to a different address.

Now you can create impressive teletext displays with ease. Have fun with your new Mode 7.

518 .quit

Mode 7 listing

18 REM MODE 7 Simulator	528 LDA char:JMP(oldvect)	1030 .cont1
28 REM By Robin Nixon		1848 LDA &D8
38 REM (c) Electron User	548 .start1	1858 AND #64
		1868 BEQ notsep
48 MODE 6:*TAPE 58 screen8=&78	560 LDA char	1878 LDI &364
18 -111 -175	FTG AUR AT	1888 LDY &365
78 cursor =&74	588 CMP 47	1898 JMP curdone
	598 BCC reset	1100 \
	600 BNE quit	1110 .notsep
100 char 255=4CF8	618 LDA #1	1128 LDX &318
	628 STA on2	1130 LDY &319
	638 STA flag	
138 oswrch =&FFEE		
148 osword =AFFF1	ASR startla	
158 osbyte =&FFF4	658 .startla 668 LDA #4:JSR oswrch	1179 STV cursor+1
160 FOR PASS=0 TO 2 STEP2	ATR TYA-PHA	1188 LDA cursor
178 PX=&E88		1198 BEQ notf12
188 COPT PASS	ASS I DY #4	1200 JSR restore
108 init	788 ISP nehvte	1218 \
200 I DA wrchurt+1	788 JSR osbyte 718 PLA:TAX	1220 .not#12
218 CMP Betart DIV LISS	728 LDA #buffer MOD &188	1238 LDA char
228 BEQ initend	738 STA &6:STA &4	1248 CMP #12
238 STA aldust+1	748 LDA #buffer DIV &188	1250 BNE not1f3
258 CTA alduset	758 STA &7:STA &5 768 LDA #8:STA &D8	1278 LDA #22: JSR oswrch
	778 LDA #29:STA #389	
	788 LDA #5:STA &38B	
288 LDA #start DIV &188	798 LDA #12:JSR oswrch	1300 JSR osbyte
	888 LDA 98:STA flag	1310 PLA: TAX: PLA: TAY
	818 JMP (oldvect)	1320 JMP startla
318 STA &228	828 \	1338 /
328 LDA @blankout DIV&188	838 .reset	1340 .not1f3
338 STA &221	848 TXA:PHA	1358 CMP #18
348 \	858 LDA #13	1360 BNE notlf
350 .initend	868 LDX 44	1370 LDA cursor+1
360 JMP restore		1388 CMP #29
378 \	878 JSR osbyte	1398 BNE not1f
388 .start	888 PLA:TAX	1480 JSR scroll
398 STA char	898 LDA 68	1418 \
488 LDA flag: BNE quit	988 STA on1	1420 .notlf
418 LDA on2: BEQ start8	918 STA on2	1438 CMP #32
428 JMP cont	928 JMP quit	1448 BCS not1f1
	938 \	1450 JMP exit
438 \	940 .cont	1460 \
440 .start0 450 LDA char	958 LDA &26A: BNE quit	1478 .notlf1
IN SAME COMMENTS	968 TYA:PHA:TXA:PHA	1488 LDA cursor+1
468 CMP #22	978 LDA char	1498 SEC
478 BNE start1	988 CMP #22	1500 SBC 05
488 LDA #1	998 BNE cont1	1518 TAY
	1888 LDA #8:STA on2	IJIE (M)
580 \	1818 JMP exit	

1828 \

From Page 27

1520 LDA table1.Y 1538 STA offset 1548 LDA table2.Y 1558 STA offset+1 1568 LDY cursor 1578 LDA char 1580 CMP #127 1598 BNE notflia 1600 LDA #8 1618 \ 1620 .notflla 1638 STA (offset),Y 1648 LDA cursor 1658 CMP #39 1668 BNE noscroll 1678 LDA cursor+1 1688 CMP #29 1698 BNE noscroll 1700 JSR scroll 1718 \ 1728 .noscroll 1738 LDA char 1748 CMP #127 1750 BNE noscroll1 1760 JMP exit 1778 \ 1788 .noscroll1 1798 LDA char 1889 CMP #128 1810 BCC notcode 1828 CMP #168 1838 BCS notcode 1848 LDA #32:STA char 1850 JMP exit 1868 \ 1878 .notcode 1888 LDY #8 1898 \ 1988 .lookback 1918 LDA (offset),Y 1928 CMP #128 1930 BCC next 1948 CMP 0168 1950 BCS next 1968 SEC 1978 SBC #128 1988 TAX 1998 LDA table4,X 2000 BEQ next 2818 CMP #1:8NE code2 2030 JMP next 2848 \ 2858 .code2 2868 CMP #2: BME code3 2070 LDA #8:STA double 2888 JMP next 2898 \ 2100 .code3 2110 CMP #3:BNE code4 2128 LDA #1:STA double 2138 LDX cursor+1 2148 SEC 2150 SBC #5 2168 LDA table3, X 2178 BNE code3a 2188 INX 2198 LDA #1 2208 STA table3, X 2218 LDA #8:STA topbot 2228 JMP next 2238 \ 2248 .code3a 2250 LDA #1:STA topbot 2260 JMP next 2278 \ 2280 .code4 2298 CMP #4: BME code5 2300 LDA #1:STA graph 2318 JMP next 2328 \ 2338 .code5 2348 CMP #5:BNE code6 2350 LDA #8:STA sepcont 2368 JMP next 2378 \ 2388 .code6 2398 LDA #1:STA sepcont 2488 \ 2418 .next 2428 INY 2438 CPY cursor 2448 BNE lookback 2458 LDA graph 2468 BEQ next1 2478 LDA char 2488 CMP #35: BE@ next1 2498 CMP #64: BCC gc 2500 CMP #95:BCC next1 2518 CMP #192: BCC gc 2528 CMP #224: BCC next1

2530 \

2548 .gc

2550 LDA cursor

2568 BER next!
2578 JSR graphics
2588 LBA &&FF:STA char
2598 JMP notspecial
2688 \
2618 .next!
2628 LDA char
2638 CMP #223
2648 BNE next!a
2658 LDA #35:STA char
2668 \
2678 .next!a
2688 CMP #&FF
2698 BNE next!b

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2718 LDA #&FF:STA char

2700 JSR graphics

2728 JMP notspecial 2738 \ 2748 .next1b 2758 AND #47F:STA char 2768 CMP #91: BCC next2 2778 CMP #96: BCS next2 2788 CLC 2798 ADC #155 2888 STA char 2818 JMP notspecial 2828 \ 2838 .next2 2840 CMP #123 2858 BCC notspecial 2868 CMP \$127 2878 BCS notspecial 2888 CLC 2898 ADC #128 2900 STA char 2918 \ 2920 .notspecial 2938 LDA double: BEQ exit 2948 LDA cursor: BEQ exit 2958 LDA char:STA buffer 2968 LDX #buffer NOD &188 2978 LDY #buffer DIV &188 2988 LDA #4A: JSR osword 2998 LDX #8:LDY #8 3000 LDA topbot: BEQ udc 3818 LDY #4

3838 .udc 3848 LDA buffer+1,Y 3858 STA char 255, X 3060 INX 3878 STA char 255, X 3080 INX: INY 3898 CPX #8: BNE udc 3100 LDA #&FF:STA char 3118 \ 3120 .exit 3138 PLA: TAX: PLA: TAY 3148 LDA char 3158 JMP (oldvect) 3168 \ 3178 .graphics 3188 LDY #8 3198 LDA #8 3200 \ 3218 .clear 322@ STA char 255-1, Y 3238 DEY 3248 BNE clear 3250 LDA char 3260 AND 047F 3278 SEC 3280 SBC #32 3298 CMP #32 3300 BCC bit1 3318 SEC 3320 SBC 432 3338 / 3348 .bit1 3358 STA char 3368 LDA #1 3378 BIT char 3380 BEQ bit2 3398 LDA char 255 3488 ORA #4F8 3418 STA char 255 3428 LDA char 255+1 3430 ORA 0%F8 3448 STA char 255+1 3450 LDA char 255+2 3468 DRA #&FB 3478 STA char 255+2 3488 \ 3498 .bit2 3500 LDA 02 3518 BIT char 3528 BEQ bit3 3538 LDA char 255

3548 ORA 0&F

3828 \

2828 LDA #8:STA graph

4618 LDX #1 3550 STA char 255 4888 STA char 255+6 5128 NEXT 3568 LDA char 255+1 4898 LDA char 255+7 4628 LDY #8 5138 DATA 8,24,48,126,126, 3578 DRA #&F 4188 ORA 8&F 4638 \ 48,24,8,64,64,64,76,82,4,8, 3588 STA char 255+1 4118 STA char 255+7 4648 .tabloop 30, 8, 24, 12, 126, 126, 12, 24, 8, 3598 LDA char 255+2 4128 \ 4658 LDA table3,X 8,24,68,126,98,24,24,8,8,8, 3608 ORA #4F 4130 .separated 466@ STA table3, Y 8,254,254,8,8,8,32,32,32,34 4148 LDA sepcont 3618 STA char 255+2 4670 INX: INY ,38,18,15,2,48,48,48,48,48, 4150 BNE sep1 4688 CPY #48 3628 \ 48, 48, 8, 96, 16, 96, 18, 182, 18, 4160 RTS 3638 .bit3 4698 BNE tabloop 15,2,8,16,8,124,124,8,16,8 5148 RESTORE 5138 4178 \ 3648 LDA #4 4788 PLA: TAX: PLA: TAY 3658 BIT char 4180 .sep1 4718 \ 5150 FOR XX=&CD0 TO &CF7 4198 LDY #8 5168 READ ?XX 3668 BEQ bit4 4728 .restore 4288 \ 4738 LDA #8 5178 NEXT 3678 LDA char 255+3 4748 STA graph 5180 CALL init 3688 DRA \$4F8 4218 .seploop 5198 MODE7 4220 LDA char 255-1.Y 3698 STA char 255+3 4758 STA double 5288 END 3788 LDA char 255+4 4238 AND #&77 4768 STA sepcont 3718 DRA #4F8 4248 STA char 255-1, Y 5218 DEF FNt1data 4778 RTS 4258 DEY 5228 RESTORE 5278 4788 \ 3728 STA char 255+4 4268 BNE seploop 5230 FOR XX=1 TO 25 4798 .blankout 3738 \ 4278 LDA #8 5248 READ ?PX:PX=PX+1 4888 PHP: PHA: TXA: PHA: TYA: P 3748 .bit4 4288 STA char 255+2 **5258 NEXT** 3758 LDA #8 HA 5268 =PASS 4298 STA char 255+4 4818 LDA 0&FF 3768 BIT char 5278 DATA &31,&59,&81,&A9, 4300 STA char 255+7 4828 STA &FE88 3778 BEQ bit5 &D1,&F9,&21,&49,&71,&99,&C1 4318 RTS 4838 STA &FE89 3788 LDA char 255+3 ,&E9,&11,&39,&61,&89,&B1,&D 4328 \ 4848 LDX #178 3798 DRA #&F 9, &81, &29, &51, &79, &A1, &C9, & 4330 .scroll 3888 STA char 255+3 4858 \ 4348 TYA: PHA: TXA: PHA FI 3818 LDA char 255+4 4868 .bpause 4358 LDA #&31 5288 DEF FNt2data 4878 LDY #5 3828 ORA #&F 5298 RESTORE 5348 4368 STA scroll1+1 3838 STA char 255+4 4888 \ 5388 FOR XX=1 TO 25 4378 LDA #489 3848 \ 4898 .bloop 5318 READ ?PI:PI=PI+1 4388 STA scroll1+4 3850 .bit5 4988 DEY: BNE bloop 5328 NEXT 4398 LDA #458 3868 LDA #16 4918 DEX: BNE bpause 5338 =PASS 4488 STA scroll1+2 3878 BIT char 4928 LDA #16:STA &FE@8 4418 STA scroll1+5 5348 DATA &58, &58, &58, &58, 4938 LDA #17:STA &FE89 3888 BEQ bit6 458,458,459,459,459,459,459 4428 LDX #4 4948 PLA:TAY:PLA:TAX:PLA:P 3898 LDA char 255+5 ,&59,&5A,&5A,&5A,&5A,&5A,&5 4438 LDY #8 3988 ORA #&F8 A, &5B, &5B, &5B, &5B, &5B, &5B, & 4958 RTS 3918 STA char 255+5 4448 \ 4968 \ 58 4458 .scroll1 3928 LDA char 255+6 5350 DEF FNt4data 4978 .char EQUB 8 4468 LDA &5831,Y 3938 DRA #4F8 4988 .sepcont EQUB 8 5368 RESTORE 5418 4478 STA &5889, Y 3948 STA char 255+6 4998 .on1 EQUB 8 5378 FOR XX=1 TO 32 4488 INY 3958 LDA char 255+7 5000 .on2 EQUB 0 5388 READ ?PX:PX=PX+1 4498 BNE scroll1 3968 ORA \$4F8 5398 NEXT 5818 .flag EQUB 8 4500 INC scroll1+2 3978 STA char 255+7 5020 .graph EQUB 0 5400 =PASS 4518 INC scroll1+5 3988 / 5418 DATA 8,1,1,1,1,1,1,1,1, 5838 .double EQUB 8 4520 DEX 3990 .bit6 8,8,8,8,2,3,8,8,8,4,4,4,4,4 4538 BNE scroll1 5848 .topbot EQUB & 4888 LDA #32 ,4,4,8,5,6,8,8,8,8,8,8 5050 .table1 4548 LDY 048 4818 BIT char 5868 OPT FNtidata 4558 \ 4828 BEQ separated 5878 .table2 4568 .scrol12 4030 LDA char 255+5 This listing is included in 5888 OPT FMt2data 4578 LDA #8 4848 ORA 0&F this month's cassette 5898 .table4 4858 STA char 255+5 4588 STA &5BF1, Y tape offer. See order 5188 OPT FNt4data 4598 DEY 4868 LDA char 255+6 form on Page 53. 4878 DRA 6%F 5118] 4600 BNE scrol12

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Access No. (if applicable)

TTION .. COMPETITION .. COMPL

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W I N

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- 1 How much memory is left after plugging in the AP4 (more, the same, or less)?
- 2 What are the three interfaces in the AP5?
- 3 How many screen modes does the Acorn Electron have?
- 4 How many buttons are there on the AMX mouse?
- 5 What does the abbreviation WIMP stand for?

W I N 1st prize: AP5 interface plus AMX mouse package

2nd prize: Advanced 1770 DFS and Advanced rom Adapter II

3rd prize: Advanced rom Manager and Advanced rom Adapter I Come up with a practical suggestion for a new product that ACP could add to its range. It can be either hardware, software, or both. Write up to 100 words describing your idea – use a diagram if you feel it necessary. You may use an additional sheet of paper for your suggestion.

RULES

- Cut out or photocopy the entry form, fill in all the details and send to the address below to arrive no later than January 31, 1987.
- You can enter one or both competitions at the same time. Winning one competition does not make your entry void for the other.
- The judges' decision is final. The results will appear in the April issue of Electron User.
 NB: You will need a Plus 1 interface to use most of these prizes.

Send to: ACP Competition, Electron User, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

Part five of TREVOR ROBERTS down-to-earth series



A number of facts about strings

BY now you should have no trouble with string variables such

LET letters="a"

and:

0

0

LET names="Bodger"

It should be easy to see how they differ from the numeric variables we can create with assignments such as:

LET number=23

or:

LET total=188

It takes a little more insight to see that:

LET number \$= "123"

creates a string variable even though the string itself is made up of numbers. In fact when the numbers are put in a string like this they stop being treated as numbers by the Electron and are just dealt with as characters like a or f or &.

In that case you might ask why bother, but as you get further into the world of programming you'll see that putting figures into strings and the reverse are important techniques.

Sum more facts about strings

0

0

0

0

0

0

0

0

LET'S stick to putting numbers in string variables with:

LET aMumber \$= "5"

LET another Number \$= "18"

Now it should come as no surprise that after this:

PRINT aMumbers

PRINT another Numbers

results in 5 and 10 appearing. However don't be fooled, they're not numeric variables, they're strings as the dollar sign - \$ - at the end of the variable names tells you. So you can't do maths with them, though no doubt you'll try it many times during your programming career!

If you don't believe me try:

PRINT aNumbers another Numbers

If you thought that you'd get 50 (5*10) then think again. As the:

Type eiseatch

message points out, you've made a mistake. You're trying to get strings to do something that they can't do. Stick to numerics for your sums and you'll be all right.

Test out your understanding of the difference between string and numeric variables by trying to explain what happens when you enter the following commands:

LET ones="1"

LET twos="2"

PRINT onesetwos

LET one="1"

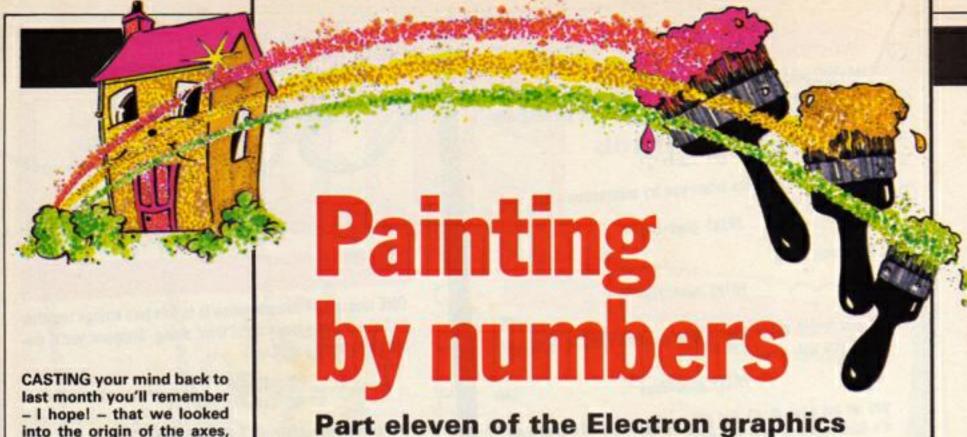
LET two="2"

LET one=1

LET two=2

PRINT onestwo

	O Con+cat+e+nation			
	HAVING said that you are to t		See	
	something very like it. Set up a couple of string variables with:		The state of the s	
	I ET		The second second	3
1	LET twos="2"			
1,	and see what happens when		Consecution (Consecution)	
1		П		
10	PRINT ones-twos		Jummer many	_
(or division using:		More strings attached	ı
(PRINT one\$/two\$		- AND	ı
			ONE like use of concatenation is to join thus strings at	ı
C	As you might expect, the Electron doesn't like it. However,		to form a more meaningful third string. Suppose you'd created two strings with:	ı
_				ı
0	PRINT one\$+two\$	0	firstname\$="Trevor" surname\$="Roberts"	ı
0	you do get a result, 12. But although we've used a plus sign,		V	ı
_	After all 1+2 is 2 not 12	0		ı
0	What's barrier is	0	fullname\$=firstname\$+surname\$	ı
_	or concatenated.			
0	While we won't do more than introduce it here, concaten-	0	There's one problem with this, as you'll see if you try to display fullname\$ using:	
	part of programming knowled with the more advanced			
)	part of programming known as string handling. For now just	0	PRINT fullnames	
			You get:	
)	PRINT one\$+two\$	0	TrevorRoberts	
)	has a very different result from:	_		
	PRINT twas+ones	0	— that is, my name without a space between. This can be remedied by including a space after the final letter of Trevor or before the first shared a space after the final letter of Trevor or	
		0	Delore the Hist character of Roberts Or since we've inst land	
~			about concatenation, we could use:	
(O William Harrison	0	fullname\$=firstname\$+* *+surname\$	
١,	Getting the message		or even:	
1	WE can use string variables to save us an awful lot of typing.	0	space\$=* *	
1	Suppose, for reasons best known to ourselves, we decided to have our Electron give us three cheers. We could do this with	_	fullname\$=firstname\$+space\$ +surname\$	
1	the simple program:	0	200 U.S.D.	
1		0	While you've been marvelling over the joys of concatenation, have you noticed something? We've stopped using LETs	
	18 PRINT "Hip hip hooray"	0	" our assignments, some Basics won't allow this but at-	
(O 28 PRINT "Hip hip hooray" 38 PRINT "Hip hip hooray"	0	Lieution has enough sense to figure out what's beautiful	
			without a LET. So from now on you're let off LET.	
1	If you've typed it in and are wondering why nothing is	-		
	happening, remember that the program lurks in memory waiting for a RUN to bring it to life. Once you've given this			
1	word of power our micro obliges with the cheers.		1 200	
	As you typed the program in, it may have occurred to you		PLET	
	that most of it is exactly the same. And you might have		96 2 Two= 20"	
	wondered if you could save yourself a bit of work. Go to the top of the class if you came up with a program like:			
	top of the class if you came up man a pros-			
	O 18 hips="Hip hip hooray"		and the same	A
	28 PRINT hip\$ 38 PRINT hip\$			
	48 PRINT hip\$			
	O By using a string variable to hold a long string we can save			
	ourselves a lot of typing. And that will come in handy as we			
	explore how programs work next month.			



series by TREVOR ROBERTS

into the origin of the axes, the part of the screen that the Electron takes as 0,0.

Until then this had always been the bottom left corner of the screen but it was too simple to stay like that for long.

Undeterred by complexity we learnt how to move the graphics origin around the screen using VDU 29.

This takes the form:

VDU 29, xorigin; yorigin;

where xorigin and yorigin are the coordinates of the point we wish to be the new centre of the screen.

Using this we saw that the punctuation was vital confuse a semicolon with a comma at your peril!

And we also came across negative coordinates for our DRAW and MOVE commands. Figure I should refresh your memory.

Once that's been done,

Program I should cause you no problems. It just draws a series of vertical bars up the screen.

But how does the program do it? Not by using DRAW and MOVE with different coordinates, that would be too easy. Fiendishly, it uses VDU 29.

Line 20 puts the Electron into Mode 5, the four colour

18 REM Program I

28 MODE 5

38 FOR 100p=8 TO 1888 ST

EP 188

48 VDU 29,100p;100p;

50 HOVE 8,0

60 DRAW 8,188

70 NEXT loop

Program I

graphics mode that we've used for most of our programs.

Then the program enters a FOR ... NEXT loop. The body of the loop is made up of a solitary VDU 29, a MOVE to the origin (0,0) and a DRAW which paints a line from 0,0 to 0,100.

Nothing remarkable about that, you might think.

The cunning bit lies in the fact that each time round the loop, the origin is moved by the VDU 29 command of line

And as this takes the form:

VDU 29, loop; loop;

and loop increases by 100 each time round, so the origin creeps up the screen from left to right.

At first it sits at 0,0 but the second time round the loop loop has the value 100 and so the VDU 29 of line 40 has an effective value of:

VDU 29,100;100;

The following MOVE and DRAW now take this point as the origin for the new

As the loop cycles, loop increases in value, the origin moves up the screen and with it the position of the line that's drawn.

There's one point about the program that you might have missed - I did and I wrote it!

Notice that the VDU 29 always works with the bottom left corner taken as 0,0.

In other words the VDU 29

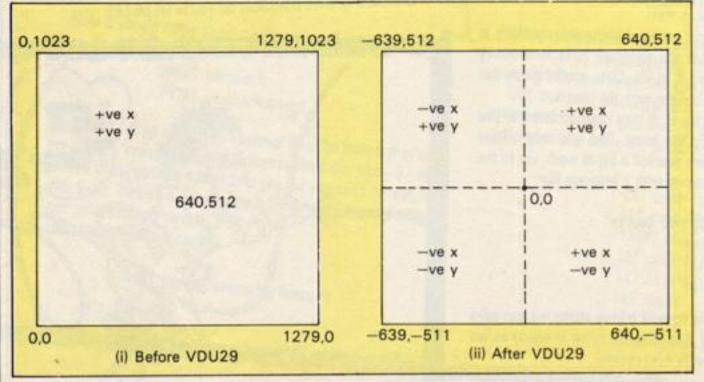


Figure 1: The effect on the screen coordinates of VDU29,640;512;

	18 REM Program II
	20 MODE 5
	38 VDU 5
	48 FOR loop=8 TO 1888 ST
EP	100
	58 VDU 29,100p;100p;
	68 MOVE 8,8
	78 PRINT "HI!"
	88 NEXT loop
118	98 VDU 4

Program II

command ignores any new origin that might have been created by a previous VDU

If this wasn't the case successive lines would be drawn with progressively larger gaps between them.

Program II uses the same method but it now has VDU 5 linking the text and graphics cursors. Once this is done, the wandering origin technique is used to send a series of greetings up the screen.

If you cast your mind back to our "Hello" program of last October you'll see that this might be a better way of doing it.

Once you've got over the glories of all that, have a look at Program III which takes most of what we've done so far and uses it to create a pattern or mandala.

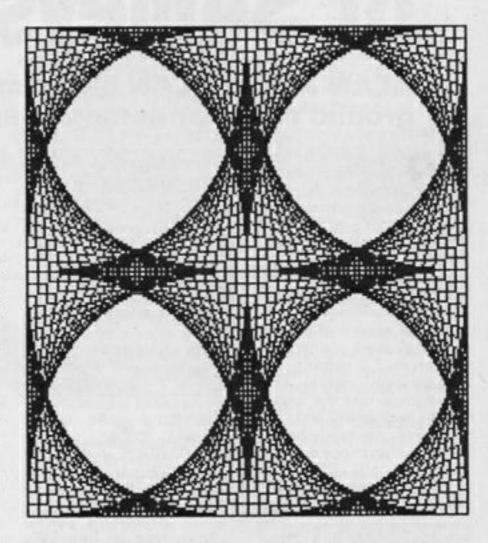
I won't go into it in detail but leave it to you to figure out. There's nothing strange about the graphics commands used though you might need a pencil and paper to work out exactly what PROCtwoSides does.

Once you've cracked that you should be able to see how PROCtwoSides is called four times to make up PROCsquare which is itself called four times to make up PROCfourSquare.

And once you've got Program III up and running you can indulge in that great pastime, mucking about.

It's amazing how much you can learn by simply messing around with a program (making sure that you've got a copy of the original safely saved to tape or disc).

Why not add a touch of recursion with the following:



25 time=8

95 time=time+1:6COL 0,time: IF time(3 THEN PROCfourSquare(length/2,gap/2,beginx/2,beginy/2)

As well as being more colourful, you get a 3D effect.

If you want more colours why not add:

255 SCOL 8,100p MOD 4

to the original program or even:

20 MODE 2 255 GCOL 0,1000 MOD 8

for a more colourful pattern.

And if you want to see something odd try:

20 MODE 2 255 GCOL 0,1000 MOD 8 + 8

The mandala seems to pulse, doesn't it? Why?

And, as a final touch, why not have mandalas inside a mandala with:

35 PROCfourSquare (98,18,836

36 PROCfourSquare (98,18,436,784)

37 PROCfourSquare (98,18,436,384)

38 PROCfourSquare(98,18,836,384)

What about creating a graphics window for the mandala and a text window for appropriate titles? You could even use VDU 5 to label the patterns.

By the time you've finished playing around with the program you should thoroughly understand the graphics commands we've covered so far. More next month. 18 REM Program III

28 MODE 1

38 PROCfourSquare (408,28,648,512)

48 END

58 DEF PROCfourSquare(le ngth,gap,beginx,beginy)

68 PROCsquare(length,gap,beginx,beginy)

70 PROCsquare(length,gap,beginx,beginy-length)

80 PROCsquare(length,gap,beginx-length,beginy-length)

90 PROCsquare(length,gap beginx-length,beginy)

188 ENDPROC

118 DEF PROCsquare(length, gap,cornerx,cornery)

120 PROCtwoSides(length,g ap,cornerx,cornery,1,-1)

138 PROCtwoSides(length,g ap,cornerx+length,cornery,-1,-1)

140 PROCtwoSides(length,g ap,cornerx+length,cornery+l ength,-1,1)

150 PROCtwoSides(length,g ap,cornerx,cornery+length,1 ,1)

160 ENDPROC

170 DEF PROCtwoSides(leng th,gap,startx,starty,signx, signy)

188 LOCAL x1,y1,x2,y2,rep

198 repeats=INT(length/ga p)+1

200 x1=startx

210 yl=starty-signy*lengt

220 x2=startx

238 y2=starty

240 FOR loop=1 TO repeats

258 MOVE x2, y2

268 DRAW x1, y1

278 x2=x2+signx+gap

288 yl=yl+signy*gap

298 NEXT

300 ENDPROC

Undeterred by complexity we learn how to move the graphics origin around the screen . . . ?

Program III

IF you followed last month's session with the Smileys you should have a listing which matches Program I identically.

We can now progress further and make the game a little more interesting.

We need to put in the numbers 0-9 for the X and Y coordinates, over the columns and down the right hand side. We do this with two FOR ... NEXT loops that use the variables numx and numy to position the numbers, and print them by subtracting 4 and 7 from them respectively, to create the digits 0-9. The reason I avoided the number 10 here is because it has two digits and would have made the screen untidy.

By the way you can't use PROCwindow because the parameter you wish to print is a numeric variable rather than a string, and you would generate an "arguments" error.

Lines 430 and 440 use PROCwindow to print an x and y along the horizontal and vertical axes.

To complete DEFPROCgrid therefore, you need to add lines 410-450.

418 FOR numx=4 TO 13:COLO
UR 3:PRINTTAB(numx,5);numx4:NEXT numx
428 FOR numy=7 TO 16:PRIN
TTAB(15,numy);numy-7:NEXT n
umy
438 PROCwindow(2,2,9,3,"x
")
448 PROCwindow(2,2,17,12,
"y")
458 PROCdelay(2)

Listing II

Making more of Smileys

ALAN McLACHLAN offers more ground rules for game writers

Run the program as you have it now and you should see on the screen, in addition to 100 yellow boxes, the numbers 0 to 9 running across the top of the columns, and also down the right-hand side, with a small x and y showing the axes, as in Figure I.

If your screen differs in any way, check your typing for errors, including all punctuation marks, and most important the semicolons in lines 410 and 420.

We are now ready to put in the hidden happy smilers. Line 60 calls DEFPROC smileys starting at line 470 which uses the random number generator to hide 10 Smileys within our array hax ()

A FOR ... NEXT loop first of all places random numbers in the coordinates smileyx and smileyy. Then using line 520 we place 1s in those elements in our array. Line 510 checks to see whether any selected element already has a 1 in it, and if so, sends the program back until an array element is encountered with a 0.

You can check whether

Listing III

your Smiley generator has worked by first of all removing line 55 and replacing it with "dummy" line 65.

65 GOTO 65

Now type in line 525, which is a temporary line and will be removed later.

525 PROCwindow(2,1,smileyx+ 4,smileyy+7,"+")

If you run the program you should find 10 red asterisks in the grid boxes showing the locations of the "hidden" Smileys. You can leave this line in for a while as it will be useful later for testing purposes.

OK, we've drawn the grid,

initialised it, and hidden the Smileys. We are now ready for the input routine.

Remove line 65 and type in the next procedure.

```
558 REM ......
 568 DEFPROCinput
 578 PROCwindow(1,8,8,8,""
):COLOUR129:CLS
 588 PROCwindow(1,8,2,1,"6
uess number: "):PRINTTAB(15,
1) turns: PRINTCHR$ (7)
 598 PROCdelay(1)
 688 PROCwindow(1,3,2,3,"I
nput x,y -")
 618 REPEAT: guessx=8ET-48:
UNTIL quessx)=8 AND quessx(
=9
 628 PRINTTAB(14,3); guessx
 638 REPEAT: guessy=8ET-48:
UNTIL guessy>=8 AND guessy(
=9
 648 PRINTTAB(16,3); guessy
 658 turns=turns+1
 668 ENDPROC
```

Listing IV

This deals solely with your input to the computer. It prints two lines of text

```
10 REM Al's Sailey Hunt
                              158 DIM box (9,9)
 28 MODE 5
                              168 VDU23;8282;8;8;8;
 38 PROCinit
                              178 VDU23,224,8,126,126,1
 40 PROCtitle
                            26,126,126,126,8
 50 PROCgrid
                              188 VDU23,225,126,255,153
 55 80TO 55
                            ,255,189,195,255,126
                              185 ENVELOPE 1,1,58,-58,8
 68 PROCsaileys
 78 REPEAT
                            ,1,1,8,126,8,8,-126,126,126
 88 PROCinput
                              198 ENDPROC
98 PROCcheck
                              188 UNTIL saileys>9
                              218 DEFPROCWINDOW(W,col,w
118 PROCfinished
                            X, WY, A$)
128 PROCresults
                              228 COLOUR col
138 REM*************
                              238 IF W=1 THEN VDU28,8,4
148 DEFPROCinit
                            ,19,8
```

using PROCwindow at lines 580 and 600, then uses the GET command to await your input. Lines 610 to 640 first of all validate your input, only accepting numbers between 0 and 9 and then having assigned the resultant number to variables guessx and guessy prints them out with a comma already between.

Line 650 simply adds 1 to the variable turns to keep tabs on how many attempts you've had. We'll use this later to print out a result.

Unfortunately you can't really check whether this routine is working correctly at this stage without a routine to process the information that you are inputting. Therefore, let's continue by typing in the next two procedures DEF-PROCcheck and DEFPROCright.

678 REM 680 DEFPROCcheck 698 COLOUR128 700 IF box (guessx, guessy) =2 THEN PROCwindow(2,3.0,20 ,"You've had that one!"):PR OCdelay(2):PRINTTAB(0,20);S PC(28): ENDPROC 718 flagx=8:flagy=8 720 IF box (guessx, guessy) =1 THEN PROCright ELSE PROC window(2,0, guessx+4, guessy+ 7." "): FOR snd=50 TO 0 STEP -5: SOUND 1,1, snd, 1: NEXT sn 730 FOR column=0 TO 9: IF box(column, quessy)=1 THEN f lagy=1 748 NEXT column 750 FOR row=0 TO 9: IF box (quessx.row)=1 THEN flagx=1 760 NEXT FOR

750 FOR row=0 TO 9:IF box
(guessx,row)=1 THEN flagx=1

760 NEXT row
770 IF flagx=1 AND flagy=
0 THEN PROCwindow(2,1,0,20,
"Right column")
780 IF flagy=1 AND flagx=
0 THEN PROCwindow(2,1,0,20,
"Right row")
790 IF flagy=1 AND flagx=
1 THEN PROCwindow(2,1,0,20,
"Right row")
800 PROCdelay(3):PRINTTAB
(0,20);SPC(20)
810 ENDPROC

Listing V



Listing VI

The first DEFPROCcheck scans our input to see whether we have found a Smiley or not and line 720 does quite a lot here. It starts by checking to see if there is a 1 in the array element chosen.

If we have a bullseye, we go immediately to DEFPROC right at line 900 where a Smiley face, CHR\$(224) is printed at the location, and a suitably triumphant noise is generated.

Then smileys is incremented by one, and finally a 2 is placed in the array element to show that this particular location has been used. Line 700 checks for this number 2 and displays a message to that effect.

Should we fail to find a Smiley, a blank space is printed at the location and the line and column of that guess are checked to see if either contains a Smiley, in order to facilitate clues.

The clues are selected by setting flagx or flagy to 1 according to whether a column, or row, or both actually hold an undiscovered Smiley. These clues are intended to remove the guesswork, and from their content you should be able to plan your next choice.

We can now check that the game is running correctly so far. Enter line 105.

185 STOP

Now you can test out your input and detection routines by running the program again. Once the Smiley target figure in line 100 is reached, the program stops with a Break at line 105.

When you are happy that everything is working all right, remove line 105 and type in the next procedure DEFPROCfinished.

Listing VII

This detects the last Smiley and prints a message on the screen to that effect.

The final procedure DEF-PROCresults is entered via line 120.

Listing VIII

This prints out the end result of your efforts. It simply takes the variable turns and prints it as part of

a message. It then prompts to see if you wish to play another scintillating game. Once more it uses the GET command to await your key press. Note also how I've ANDed the resultant key press with &DF to catch both upper and lower case entries of Y or N.

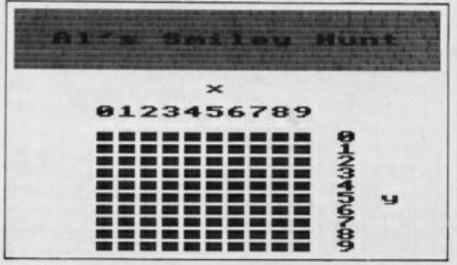
A positive response takes you back to line 40 carefully avoiding the arrays which must not be re-DIMmed, as mentioned last month.

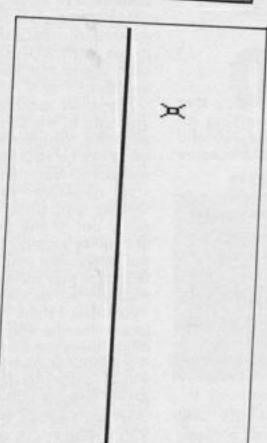
A negative response throws you unceremoniously out of the program, and quite rightly, too. It's not every day you get the chance to play something as exciting as Smiley Hunt. You know, I think I'll translate it for the Plectrum, it might make me a mint.

If having played the game a few times you are happy that it is working correctly, you can remove line 525. You'll find it's a different game altogether now.

It may not be the most sparkling program in the world, but it does contain some interesting techniques. For example, the input routines could be used in any program - they probably already have - and the checking routines could always prove useful. The important thing to me, though, is that you should have been able to follow it through line by line, procedure by procedure, and see how it was put together.

I'm going to stick my neck out now and say that it's absolutely bug-free, but I'm always prepared to be contradicted. After all, learning to de-bug programs is all part of the game, and I might have been crafty enough to have slipped one in for you to find.





ZAP the alien ships before they land or it's curtains for the human race! There may be only one alien intruder in this simple game by John Graley but there are 50 levels of difficulty ranging from super slow to furiously fast to make it a challenging shoot 'em up. Use Z to move left, X to move right and N to fire.



IMODE6: VDU19, 8,4:8:: OSC LI*FX21*: OSCLI*FX12*: INPUTT AB(18,5)**** Space Zapp *** "TAB(8,18)*Enter dificulty 1-58 *: DX: MODE5: *FX11,18

2AX=10:BX=5:CX=RND(18): HX=0:CLS:VDU23,240,24,24,24,24,24,36,66,129,255,23,241,12 9,66,60,36,36,60,66,129,19, 1,5,0,0,0,19,2,2,0,0,0,23;8 202;0;0;0;

3EX=AX:FX=BX:6X=CX:HX=H X+1:IF HX MOD (188/DX)(>8 6 0TO 6

4AX=AX+RND(3)-2:IF AX<1
OR AX>19 CLS:PRINT'''the
enemy crashed":END

58%=8%+1:IF B%>38 PRINT CHR\$38*The enemy landed!*:F ORIX=8T05888:NEXT:RUN 6A\$=INKEY\$(8):IF A\$=*%* AND C%(17 C%=C%+1

71F A\$="Z" AND CX>1 CX=

8IF A\$="N" MOVE CX+64+3 2,32:PLOT2,8,1888:PLOT2,8,-1888:IF AX=CX PRINTTAB(8,8) CHR\$7"HIT!!":FORIX=8T05888: NEXT:60T02

9COLDUR 1:VDU 31,6X,31, 32,31,CX,31,248:COLDUR 2:VD U31,EX,FX,32,31,AX,BX,241 18COLDUR 3:80TO 3

1 DIM hi\$(11).hiX(11):F

DRAX=1 TO 10:hi\$(AX)="Neil

Hoggarth.":hiX(AX)=(11-AX)*

100:NEXT:REPEAT:MODE6:PRINT

TAB(0,4)STRING\$(41,**);SPC

(38);****;SPC(13);*Space Do

dge";SPC(14);****;SPC(11)*B

y Neil Hoggarth*;SPC(11);**

*";SPC(38);

2 PRINTSTRING\$(41, "*")'
"Dodge the asteroids for as
long as you"'"can, the lon
ger you last the higher you
score."''TAB(14)"Controls
!--"TAB(5)"Z -- left";TAB
(24)"X -- right.";TAB(18,24
)"Press SPACE to start.";

3 REPEAT UNTIL BET=32:C LS:VDU23,224,255,255,126,12 6,68,68,24,24,23,1,8;8;8;8; :XX=28:scoreX=8:crashX=FALS E:REPEAT:PX=RND(48)-1:PRINT TAB(PX,24)***:VDU31,XX,8:AX =135:IF((USR(&FFF4)AND&FF88)DIV&188)(>32 crashX=TRUE

4 PRINTTAB(XX,8)CHR\$(22 4);:scoreX=scoreX+1:IF INKE Y(-98) XX=XX-1:ELSE IF INKE Y(-67) XX=XX+1

5 IFXX=-1XX=BELSEIFXX=4 8 XX=39

6 UNTILCRASHI:SOUND8,-1
5,6,18:CLS:PRINTTAB(15,9)*6
ame Over*;TAB(13,18)*You sc
ored *;scorel:IF scorel(hil
(18)SOTO9 ELSE PRINTTAB(8,1
2)*Your score puts you in t
he top ten.*:OSCLI*FX21,8*:
INPUT*Enter your name*;N\$

7 BX=8:FORAX=1 TO 18:IF hiX(AX)(scoreX AND BX=8 TH EN BX=AX:NEXT ELSE NEXT

8 FOR AX=18 TO BY STEP-1:hiX(AX+1)=hiX(AX):hi\$(AX+ 1)=hi\$(AX):NEXT:hi\$(BX)=N\$: hiX(BX)=scoreX:IF N\$=""hi\$(BX)="Mr Return"

9 PRINTTAB(8,23) "Press
SPACE to continue.":REPEAT
UNTIL GET=32:CLS:PRINTTAB(1
8,1) "Todays Top Ten Scores.
"'STRING\$(48,"-"):FORAX=1TO
10:PRINThi\$(AX);TAB(38);hiX
(AX):NEXT:PRINT'STRING\$(48,

18 PRINTTAB(8,23) "Do you want to play again (Y/N)";
:REPEAT: A\$=GET\$: UNTILA\$="Y"
OR A\$="N": IF A\$="Y" UNTIL F
ALSE ELSE MODE6: PRINT"Thank
you for playing.": END



Space Dodge By Weil Hoggarth

Dodge the asteroids for as long as you can, the longer you last the higher you score.

Controls !-

Z -- left

x -- right.

Press SPACE to start.

CAN you navigate through the asteroid belt? Neil Hoggarth's fast arcade game has full instructions and a high score table all crammed into 10 lines of Basic – amazing!

YOU can go for gold ... with the MICRO

This is the package that broke all records! More than a game — it's a brilliantly written collection of ELEVEN great track and field events!

Ever imagined yourself as another Seb Coe? Then try to run against the world record holder at 1500 metres. And if that distance is too much for you then there's always the 100, 200, 400 and 800 metres to have a go at.

Not much good at running? Don't worry, MICRO OLYMPICS has many more challenges for you. Why not try your skill at the high jump or the long jump?

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Yes, it's fast, furious fun, pitting yourself against the world's best times and distances on your micro.

You may not be another Steve Ovett or Alan Wells, but with practice you COULD become the Micro Olympics Champion!



Play Micro Olympics

– and let your fingers
do the running!

Send for it today

for £ I wish to pay by Access Visa No Exp	
CI PALCESS CI VISA NOEX	piry date
Signed	
Address	



IT'S the year 2065 and Earth is in the midst of an interplanetary war. Negotiations with Alpha Centuri have broken down and they have threatened to reduce our planet to dust.

However, to prevent unnecessary destruction each planet has agreed to choose a supreme warrior. These will battle to the death on a massive energy grid constructed between the galaxies - the champion gains complete domination over the opposing planet.

You have been chosen to represent Earth and the fate of the planet lies in your hands. To lose will mean slavery for the whole human race.

The battleships start on opposing sides of the energy grid and can move forwards, backwards, left and right but not diagonally and they can't leave the grid. The powerful hyperspace drives leave an ion trail in the craft's wake which must be avoided at all costs.

To destroy your opponent you must either force him off the grid or into your or his own ion trail.

Unfortunately Alpha Centuri have cheated and have sent a whole tribe of warriors. You must defeat them all - the whole population of Earth is counting on you.

Your Electron controls the Alpha Centurian grid warrior and there are ten levels of difficulty. You'll need to keep your wits about you if you are to survive in this challenging arcade game.

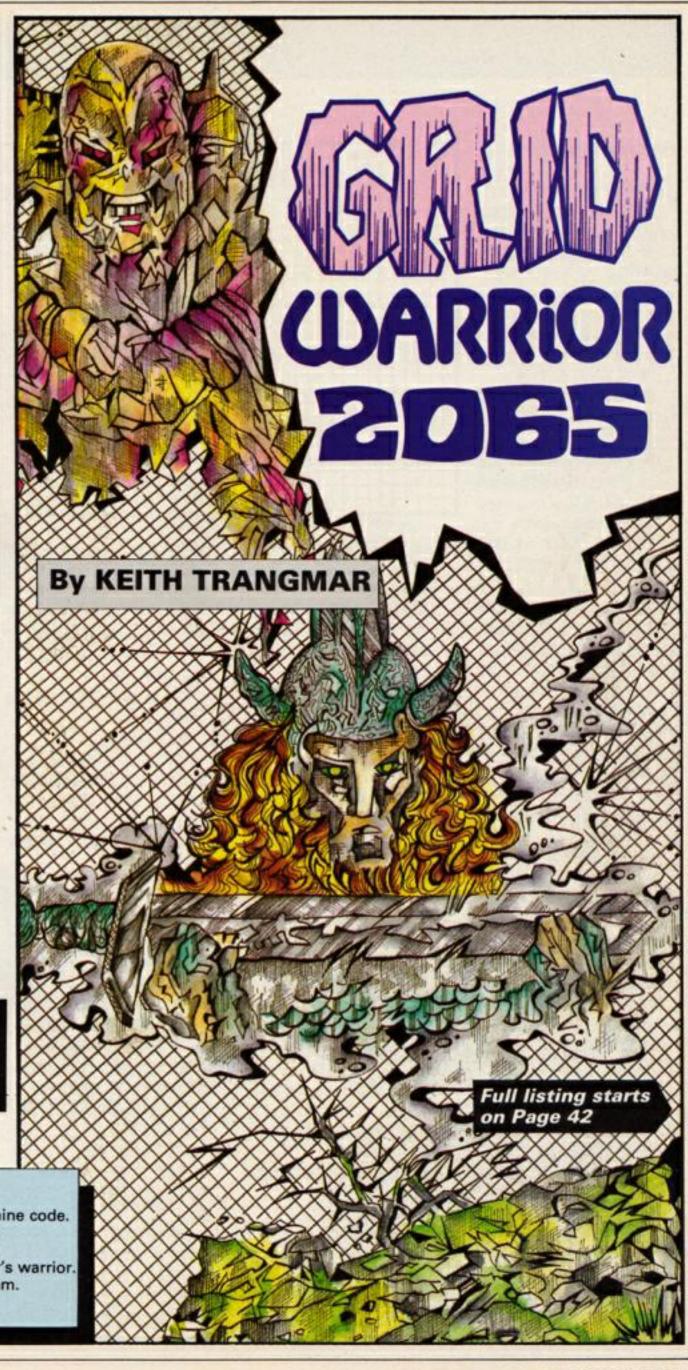
CONTROLS

Z = Left

X = Right

? = Down

* = Up



PROCEDURES

code title human comp

Assemble the machine code. Print the title page. Move your warrior.

Move the computer's warrior. relocate Relocate the program.

End of game. col

From Page 41

18 REM Grid Warrior

28 REM By Keith Trangear

38 REM (c) Electron User

48 IF PAGE>&E88 PROCrelo

cate: END

50 humanX=7:screenX=4:co

ap%=2

68 deadX=8:skillX=8:deax

%=8:time%=8

78 ON ERROR GOTO188

88 DIMBX (500,1), IXX (4), I

Y%(4)

98 #FX4.1

188 DATAB, 1, 1, 8, 8, -1, -1, 8

110 FORAX=1TO4:READ IXX(A

I), IYI(AI): NEXT

128 PROCcode

138 VDU23,78,8,8,8,8,8,15,8
,8,8,23,74,8,8,8,8,8,255,136,
136,136,23,78,8,8,8,8,248,1
36,136,136,23,81,8,8,8,8,15
,8,8,8,23,85,136,136,136,136,13
6,255,136,136,136,23,86,136
,136,136,136,248,136,136,13
6,23,91,8,8,8,8,15,8,8,8

148 VDU23,92,136,136,136, 136,255,8,8,8,23,93,136,136, 136,136,248,8,8,8,23,64,8,

28,34,73,93,73,34,28

150 ENVELOPE1,129,8,8,-1, 8,8,288,126,8,8,-126,126,12

168 ENVELOPE? ... 1,-1,1,15 ,38,15,126,5,8,-126,126,126 178 ENVELOPE3,1,2,4,1,16, 8,32,126,8,8,-126,126,126

188 MODE6

198 PROCtitle

288 MODES

218 VDU19,2,screen%;8;19, 3,comp%;8;12,23,1,8;8;8;8; 228 COLOUR131:COLOUR8:PRI

NTTAB(4,1) "Grid Warrior"

238 CALL WARRIOR

248 IF deadX>9 PROCblocks :FORAX=8T01080:NEXT

258 #FX13.6

268 PXX=64+(RND(33)+32):I F FNtest(PXX,111,32)=FALSE THEN 268 ELSE PYX=111:PIXX= 8:PIYX=32:DIR2X=1:PROCcross (PXX,PYX,1):WX=1-2*(dead%)4):BX(8,1)=PXX:BX(1,1)=PYX

278 CXX=64+(RND(29)+32):I F FNtest(CXX,879,-32)=FALSE THEN 278 ELSE CYX=911:CIXX

=8:CIYX=-32:DIRX=3:PROCcros s(CXX,CYX,3):BX(8,8)=CXX:BX (1,8)=CYX

288 LX=0: MX=2: TIME=0

298 PROChuman: MX=MX+1

388 PROCcomp: 60T0298

318 :

328 DEFPROCHUMAN: MOVEPXX, PYX: BX(MX,1) = DIR2X: GCOL8,1: IF POINT(PXX+PIXX,PYX+PIYX) <>2 THEN588

338 PXI=PXI+PIXI:PYI=PYI+ PIYI:DRAMPXI,PYI:IF INKEY(-186) OR (ADVAL(8)AND3)>8 RE PEAT:UNTIL (INKEY(-98)OR IN KEY(-67) OR INKEY(-73) OR I NKEY(-185))

340 D2%=DIR2%:J1%=ADVAL(1)DIV256:J2%=ADVAL(2)DIV256: IF J1%<5 AND J2%<5 THEN J1%=128:J2%=128

358 IF INKEY(-98) OR J1%>
158 PIXX=-32:PIYX=8:DIR2%=4
368 IF INKEY(-67) OR J1%(
188 PIXX=32:PIYX=8:DIR2%=2

378 IF INKEY(-73) OR J2%> 158 PIXX=8:PIYX=32:DIR2X=1

388 IF INKEY(-185) OR J2% (188 PIXX=8:PIYX=-32:DIR2%= 3

398 IF DIR2%(>D2% SOUND&1 1,3,88,5

488 ENDPROC

418 DEFPROCCOMP: MOVECXX,C YX: BX(MX,8) = DIRX: SCOL8,3: IF POINT(CXX+CIXX,CYX+CIYX)<>2 SOTO688

428 DX=DIRX:CXX=CXX+CIXX: CYX=CYX+CIYX:DRAWCXX,CYX:aX =POINT(CXX,CYX+32):bX=POINT(CXX,C (CXX+32,CYX):cX=POINT(CXX,C YX-32):dX=POINT(CXX-32,CYX) :eX=SGN(CXX-PXX):fX=SGN(CYX -PYX):gX=(deadX+RND(7)>7):I F (eX<>8 OR fX<>8) AND gX=T RUE THEN 458

438 ON DIRZ GOSUB 500,538 ,500,530

448 GOT0568

458 IF eX=1 AND dX=2 DIRX =4:CIXX=-32:CIYX=8:60T0568

468 IF eX=-1 AND bX=2 DIR X=2:CIXX=32:CIYX=8:60T0568 478 IF fX=1 AND cX=2 DIRX

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=3:CIXX=8:CIYX=-32:60T0568

488 IF f2=-1 AND aX=2 DIR X=1:CIXX=8:CIYX=32:GOT0568

498 GOTD438

588 IF bx=2 AND ((ax()2 A ND DIRX=1) OR (cx()2 AND DI RX=3)) DIRX=2:CIXX=32:CIYX= 8:RETURN

518 IF dX=2 AND ((aX<)2 A ND DIRX=1) OR (cX<)2 AND DI RX=3)) DIRX=4:CIXX=-32:CIYX =8

528 RETURN

538 IF aX=2 AND ((bX<)2 A ND DIRX=2) OR (dX<)2 AND DI RX=4)) DIRX=1:CIXX=8:CIYX=3 2:RETURN

548 IF c%=2 AND ((6%()2 A

ND DIRX=2) OR (dX<>2 AND DI RX=4)) DIRX=3:CIXX=8:CIYX=-32

550 RETURN

560 IF DIRX(>DX SOUND&11, 3,88,5

578 ENDPROC

588 PROCcol(1,PXX+PIXX,PY X+PIYX):PROCprint(" Tough Luck Human, you were de-re zzed",8,15):S\$=" second.":I F timeX)1 S\$=" seconds."

598 PROCprint("after only ",5,17):PROCprint(STR\$timeX +\$\$,5,18):80SUB628:PROCprint("You defeated",4,28):PROC print(STR\$(deadX-skillX)+" 8rid "+W\$+".",3,21):FORTX=8 T018888:NEXT:80T0188

688 LX=-1:PROCcol(8,CXX+C IXX,CYX+CIYX):deadX=deadX+1 :PROCprint("Well done,husan .",2.5,11):80SUB628:PROCprint(STR\$(deadX-skillX)+" "+W \$,6,13):PROCprint("de-rezze d so far.",2,15):FORTX=8T01 8888:NEXT:60T0218

618 80T0298

628 W\$="Warrior": IF dead% -skill%(>1 W\$="Warriors"

638 RETURN

648 DEFPROCcol (WI, XI, YI)

650 DRAWII, YI

668 SOUND8,-15,4,38

678 timeX=INT((TIME+58)/1

(99

688 IFdead%-skill%>deax%deax%deax%deax%=dead%-skill%

698 SOUND1,1,125+25+WX,25

788 SCOL8,2:XX=BX(8,WX):Y
X=BX(1,WX):MOVEXX,YX:FORNX=
2TOMX:PROCerase(BX(NX,WX)):
NEXT

718 COLOURS

728 ENDPROC

738 DEFPROCprint(A\$,B,C)

748 MOVE64+B,1824-32+C:VD U5:6COL8,1

758 FORA=1TOLEN(A\$):PRINT MID\$(A\$,A,1);:SOUND2,-15,58 ,1:FOR6=1TO58:NEXT:NEXT

768 VDU4

778 ENDPROC

788 DEFPROCHIOCKS

798 LOCAL A.B.C

800 FOR AZ=10 TO deadZ

918 SOUND&12,2,58,18

828 BX=RND(18):CX=RND(26)

+2: IF FNch=FALSE THEN 828 838 VDU31,8%,C%,92,18,8,8 ,86,32,18,8,74 848 NEXT 858 ENDPROC 868 DEFPROCEross (X,Y,Z) 878 BCOL0,1:80SUB930 888 FORV=1T015: VDU19,1.V; 8::SOUND&11,-5,18*V.3:FORW= OTO15: NEXT: NEXT 898 VDU19, 1, human %; 8; 988 GCOL8, 2: 60SUB938 918 6COL8, Z: PLOT69, X, Y 928 ENDPROC 938 MOVEX-38, Y: PLOT5, X+38 Y: MOVEX, Y-38: PLOT5, X, Y+38: RETURN 948 DEFFNtest (X, Y, INC): T% =TRUE:FORAX=8T03:IF POINT(X .Y+A%*INC)<>2 T%=FALSE 958 NEXT:=TX 968 DEFPROCerase(DI):XI=X 1+32*IX1(D1):Y1=Y1+32*IY1(D 1): DRAWIT, YI: ENDPROC

978 DEFFNch: LOCAL AX: CHX= TRUE: AX=135: FORXX=-1 TO 1:F ORYX=0 TO 2: VDU31, BX+XX, CX+ YX: IF (USR(&FFF4) AND &FF00) DIV256()85 CHI=FALSE 988 NEXT: NEXT: =CHX 990 DEFPROCtitle 1888 *FX14,6 1818 VDU12,20,23,1,8;8;8;8 ::PRINT' "HISCORE: "; daax%; TA B(18); "TIME: "; time%; TAB(32) : "SCORE: "; dead%-skill% 1828 PRINTTAB(13.3)*00 00 @ @@" 'TAB(12);"@ @ @" 'TAB(12) "@ @@ @@ @ @ e" 'TAB(12) ". TAB(13) "00 0 0 0 0 00" 1838 PRINT'TAB(6)** @ 6 ee ee e e ee"'TAB(6)" @ @@" 'TAB(6) "@ @ @ @ @

1848 PRINT" By Keith Trangmar." 1858 PRINT'" 'Z' moves 'I' moves right."' '+' aoves up, oves down. "'TAB(7); "'COPY' freezes the game." 1868 *FX21.8 1878 PRINT'TAB(6);:PROCpri nt("Enter Skill level - 0 t 0 9. ", 3, 38) 1888 REPEAT: VDU19,1,RND(15);8;:6%=INKEY(15):UNTIL 6%> 47 AND GX(58 1898 dead%=6%-48:skill%=de 1100 ENDPROC 1118 DEFPROCcode: FOR PASS= BTO2STEP2:PX=&988:E=&FFEE:[OPT PASS

1128 .WARRIOR LDA#17: JSRE:

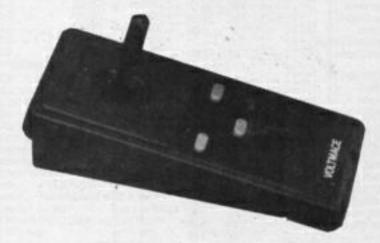
LDA#2: JSRE: LDA#17: JSRE: LDA#

128: JSRE: LDA#30: JSRE: JSRE-7

:JSRE-7:LDA#78:JSRE:LDA#74: LDX#18 1138 . A JSRE: DEX: BNE A:LDA #78: JSRE: LDY#26 1148 .B LDA#81:JSRE:LDA#85 :LDX#18 1150 .C JSRE: DEX: BNE C: LDA #86: JSRE: DEY: BNE B: LDA#91: J SRE:LDA#92:LDX#18 1168 .D JSRE: DEX: BNE D: LDA #93: JSRE: RTS 1170 J: NEXT 1180 ENDPROC 1198 DEFPROCrelocate: VDU7. 12,21:OSCLI*K.@ *TAPE:MFORA X=8TO TOP-PAGE STEP4: AX! &E8 8=AX!PAGE: NEXT!MPAGE=&E00:M ?&DF4=&9C!MRUN!F!M":OSCLI"F X138,0,128": ENDPROC

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Micro Messages

I REFER to the letter from S. Thompson in the November 1986 issue of Electron User regarding View printer drivers.

I purchased a copy of Acornsoft's View printer driver from a dealer in Stanstead, Essex. The first cassette I received would not work on my Electron, though it did work on a friend's BBC B.

I returned this cassette and received another one which carries the reference number SBB16/C.

This cassette works perfectly on my Electron and allows me to produce very versatile printer drivers for use with my Epson LX80 printer.

One problem I found with the first drivers I produced was that if the SHEETS command was used on long documents, all the printer highlight commands set at the top of the first page were deleted from page 2 onwards.

I solved this problem by answering No to the question "Include printer initialisation?" when compiling the drivers.

The LX80 does have an initialisation code - ESC @ and I had put this in to the first drivers I had produced.

However, this code resets the printer to the power-on state and is sent when Return is pressed to start printing, hence the loss of the highlight codes.

It would of course be

Printer codes and solutions

possible to repeat the highlight codes at the top of each page, but this is

The LX80 does not need this code to start printing and a highlight code is included in the printer driver program which allows all previous codes to be reset.

I hope this information will be of help to other Electron users. - J.A. Terry, Basingstoke, Hampshire.

Batting technique

I AM writing in response to Andrew Warriner's plea for help with Ian Botham's Test Match in the November 1986 issue of Electron User.

I too had problems until I went to the Electron and BBC Micro User show at UMIST. I asked the man at the Tynesoft stand if it was possible to bat and he revealed the secret. This is how it is done:

As the bowler is running up, hold down the desired direction key and when the ball reaches the wicket after its delivery, it will stop dead.

Hit the Return key as soon as the ball has stopped and the batsman will swing his

If the Return key is hit at exactly the right moment, the batsman will hit the ball in the appropriate direction.

I hope this is of some help but be warned - the game is not easy!

I have never beaten the computer yet and I think Tynesoft could have made the game a little easier. -Debbie Kirkman, Leyland, Lancs.

Disc options

I HOPE to buy a disc system for my Electron but without specialist knowledge of disc technology it is difficult to choose between the various manufacturer's products.

Could you consider running an article which weighs up the pros and cons of each system?

I am attracted to the Plus 3 largely because it is cheap about half the cost of an AP4 + disc drive.

But I am put off because you of all people appear to ignore it as a piece of hardware and hardly anybody seems to sell software for

As the official Acorn product, how about a regular article on it?.

Your June 1986 review of the AP4 interface talked about "Disc drive compatibility at long last". What is the problem with compatibility with the Plus 3?

I would certainly opt for a Plus 3 if 3.5in disc software for the BBC Micro and the new Acorn Compact will run on the Electron. - C. Talbot, Pitlochry.

We have published reviews of three disc systems for the Electron the Plus 3, (March 1985), Cumana interface (July 1985) and ACP's Plus 4 (June 1986).

These articles discuss in detail the pros and cons of each system.

A 10 part series devoted entirely to the Plus 3 ran from October 1985 to July 1986.

This covered topics such as libraries and directories, sector editors, automatic. menus, extra commands and random access filing.

There isn't much disc software available but you can swap discs with Compact owners and try their software - not all of it will run of course but it's worth experimenting.

The Compact drive is double sided but if the discs are formatted single sided there shouldn't be any problems.

All BBC B software is on DFS format discs and the ADFS can't access these.

Demand and supply

HAVING bought a Plus 3 some years ago, I have been dismayed at the support the unit has received from the major software houses.

The astonishing fact is that companies feel that the demand for Electron disc software is too low to justify a special version.

This fact was further

Faster database

SOME time ago I took advantage of your offer of the Data Manager pack including the Plus 3 and Acorn Electron Database.

I find it very useful but slow when using a large number of fields and records as it needs to frequently access the disc.

I have recently bought Advanced Computer Products sideways ram. Do you know if I can load all or part of the database programs

into sideways ram and run it as if it were a disc to speed up operations?

If this is possible I would be very grateful if you could tell me how as I find the ASR instructions a little difficult to follow. - Jeffrey Lee, Plumstead Common, Lon-

 You can put the database in sideways ram but you would be unable to run it and the ram can't be used as a ram disc.

From Page 47

supported by Steve Botterill of Superior Software who stated: "If the demand is there we'll supply it. If we get say 500 letters then that will justify it.'

So Electron disc users the ball is in our court. Let's put pen to paper and show them that there is a demand way above anything they may have anticipated. - Y. Mwanza, Isleworth, Middx.

Boxing clever

REGARDING Simon Smith's letter in the October 1986 issue of Electron User concerning the quality of Electron games, I find it hard to believe that he expected to become an ace at Boxer within ten minutes of

It took my brother and

WHAT would you like to see in future issues of Electron User?

What tips have you picked up that could help other readers?

is your Here opportunity to share your experiences.

Remember that these are the pages that you

write yourselves. So tear yourself away from your Electron keyboard and drop us a line.

The address is:

Micro Messages Electron User Europa House 68 Chester Road Hazel Grove Stockport SK7 5NY.

unfair on software companies to call some of their recent products poor.

Admittedly, Jam Butty is not the easiest of games to play, although with a bit of patience it soon becomes possible and quite enjoyable.

Another thing that people often write in about is the graphics with Electron games.

Surely they do not expect

when the Electron has only half the memory. Personally I would prefer a good game with average graphics, rather than vice versa.

Finally, thanks for the debugging sections, they are very much appreciated. John Tipper, Newbold Verdon, Leics.

Keyword **functions**

I HAVE subscribed to your excellent magazine for over a year now and enjoy typing in programs and bugging my attempts.

Even though the Electron has access to 29 complete Basic keywords by using the Func key and one other, there still remain quite a lot of Basic words common to most listings, such as MOVE, SOUND and ENVE-LOPE, which are not defined.

The following short program uses the userdefinable keys f0 - f9 for most of the other common words and commands not already defined.

18 REM Function Keys 28 *KEY8 "TAB" 38 *KEY1 "DEF" 48 *KEY2 *MOVE * 58 *KEY3 "SOUND " 68 *KEY4 *ENVELOPE * 78 *KEY5 *DATA * 88 *KEY6 "READ " 98 *KEY7 *6COL * 100 *KEY8 "STRING\$" 118 *KEY9 "CHR\$"

Run the program, type NEW and enter your own listing. -SSGT Ray Haydock, BFPO

Stocks

and shares

I WONDER how many Electron owners became interested in stocks and shares through buying Telecom and Britoil shares.

Or put another way, I wonder how many first-time

playing it for the first time.

myself nearly two hours to even reach the second screen.

I would have been more cross with Acornsoft if they had made the game easier than if they had made it harder.

A year ago I would have been inclined to agree with him about the games being poor quality.

But with software like Citadel, Way of the Exploding Fist, Rick Hanson and so on, it is extremely

to keep up with something like the Commodore 64,

Keeping the score straight

YOU may like to hear of the latest use I have found for my Electron. Having read your magazine since its start, I have not read of anything similar.

I am reasonably competent with the basics of Basic but am by no means an expert.

However, I was able to create a program that allows me to conduct meetings with my staff using an Electron and 26in colour TV instead of a flip chart.

The main reason for my writing, however, is the program for my employer's product knowledge competi-

Visionhire hold a competition every year sponsored by Philips and Pye. The final was on the 21st of October 1986 at the Forum Hotel in London with John Motson (BBC Sport) as quiz master.

All the Visionhire directors were present plus marketing executives from Philips, Pye and Toshiba.

An audience of 150 watched the competition, the prizes being a week in

Portugal for the top team three people and their spouses.

My part was first a welcome message then a scoreboard, keeping everyone updated via two 37in Philips colour TVs (yes 37in), and John Motson via a 12in monitor on his desk.

I used an aerial amplifier and splitter to feed the Electron signal the three ways.

As well as keeping score and sorting into the new order after every points input, my program also gave the six round numbers in colourful screen Mode 2.

I pinched part of a listing from Electron User that enlarged any letters or figures up to full screen size.

To be honest, I also used bits of other listings from Electron User for certain jobs - like the bubble sort and double height letters.

Also I learned about VDU5 and VDU4 to produce 3D text and the end result looked rather good (modesty not being my strong point!).

However, other parts were all my own work

including scrolling contestants' names across the bottom of the welcome screen and the design of the scoreboard layout - that being drawn once - with the teams and scores reprinted each time in a text window.

The final result was about the tenth version of the original and I had to break it into three programs to save memory - intro, semi, and final.

A simpler version was used for the area and regional heats - I sent a copy to my counterpart on each region via a cassette plus written instructions.

It was more trouble to make it workable by a third party than to write in the first place!

For instance the training officer on region four suddenly found a score of 2 became 22 or even 222! I had to disable auto repeat in the next version!

The winners in the final were the team from Tyne and Wear - now off to Portugal in May 1987.- I.B. Wiggs, Lincoln.

buyers of shares went out and bought themselves an Electron to evaluate their portfolio or their tax liability. or even to assess their liability to capital gains tax. I know I did.

At the same time I was fortunate enough to find a night school course running an elementary computer programming course.

Unfortunately it was for ten weeks only but by that time I was getting used to writing simple programs in

Basic.

And indeed I did progress to writing structured programs covering portfolio evaluation and my personal tax liability. But then I came to a full stop!

As you know, one of the things a computer can do speedily is produce graphs, charts and histograms.

These are very useful to an active investor in the evaluation and comparison of company shares using both historical and current share price information.

My night school could not get sufficient people together to warrant running a higher level course and so I couldn't enlist the aid of the tutor in helping me to understand and write charting programs.

I've searched in every book on the Electron that I've been able to get my hands on but though one or two cover graphics none appear to cover the subject of charts.

Can you recommend any publication that covers this subject in sufficient depth to aid me in programming the Electron to produce charts and histograms?

Alternatively would it be possible for one of your contributors to publish a series of articles on this subject? - J.E.Howarth, Penwortham, Preston.

 We have published many programs to produce various graphs in the past and you should be able to adapt one of these.

You'll find a graph in the April 1985 issue and a pie chart in the January 1985 issue of Electron User.

There are also multicoloured three dimensional bar charts in the January 1985 and July 1984 issues.

ALL programs printed in this issue are exact reproduction of listings taken from running programs which have been thoroughly tested.

However on the very rare occasions that mistakes may occur corrections will be published as a matter of urgency. Should you encounter error messages when you type in a program

they will almost certainly be the result of your own typing mistakes.

Unfortunately we can no longer answer personal programming queries concerning these mistakes. Of course letters about suggested errors will be investigated without delay, but any replies found necessary will only appear in the mail pages.

Heavy calibre

I AM just writing to congratulate Superior Software and Acornsoft on their fabulous game, Galaforce.

I have had it since October and have so far reached zone 25. I think it's brilliant and I hope for more games of the same calibre in the future.

I also think your magazine is excellent, keep it up. From a great fan. - Paul Twigg, Irvine, Scotland

Stored commands

I AM a long standing reader of Electron User and I was wondering if you could help me with a problem I have with View.

Everything seems to work fine until I try to use some stored commands.

After these are entered and the document printed out on my Amstrad DMP 2000, the entire line where the command is situated is deleted from the text.

This affects HT in particular, used with your View printer driver in the August 1986 issue, although I have also noticed it happens with other commands such as LM.

I have followed the instructions in the View manual and the printer driver article to the letter.

I have checked and double

checked the printer driver program and I am convinced that there is nothing wrong with the printer or printer lead.

I would be most grateful if you could suggest where I may be going wrong as I am beginning to think there is something wrong with View itself. - D.A. Colclough, Styvechale, Coventry

 There is nothing wrong with View or your equipment but you may not be using it correctly.

Stored commands should be on a line by themselves with no other text. When the file is printed the commands are executed and the rest of the line is skipped.

The text is printed as normal and you won't see the blank line on paper.

Screen scrolling

I THINK your magazine is great reading and terrific value. My favourite parts are Software Surgery and Micro Messages. Could one of your resident programmers write a program that scrolls the screen one bit at a time in any direction? I had a go, but failed dismally. -Matthew Rowley, Tamworth, Staffs.

 Scrolling the screen one bit at a time is both complicated and slow. We would advise avoiding it if possible.

Here's a short routine and a demonstration showing how to scroll a Mode 6 screen left one byte at a

time. This is much easier and faster.

18 REM Screen Scrolling 20 MODE 6 30 VDU23,1,0;0;0;0; 40 PROCassemble 50 FOR i=0 TO 48 60 PRINT "Scrolling in M ODE 6!": 70 NEXT 88 FOR i=1 TO 188 98 CALL &988 188 NEXT 110 END 128 130 DEF PROCassemble 140 counter=472 150 FOR i=0 TO 2 STEP 2 168 PX=4988 170 [OPT i 188 LDA #8:STA old+1:LDA #&68:STA old+2:STA new+2:LD A #8:STA new+1 198 LDA #31:STA counter 200 LDY 40 218 .loop 228 .old LDA &6000,Y 238 .new STA &6888.Y 240 INY: BNE loop 250 INC old+2:INC new+2 260 DEC counter: BNE loop 270 RTS 288 1 298 NEXT 300 ENDPROC

Chess problem

I AM a relative newcomer to the computer world and find your magazine a great help, particularly the advice on Basic and bug problems.

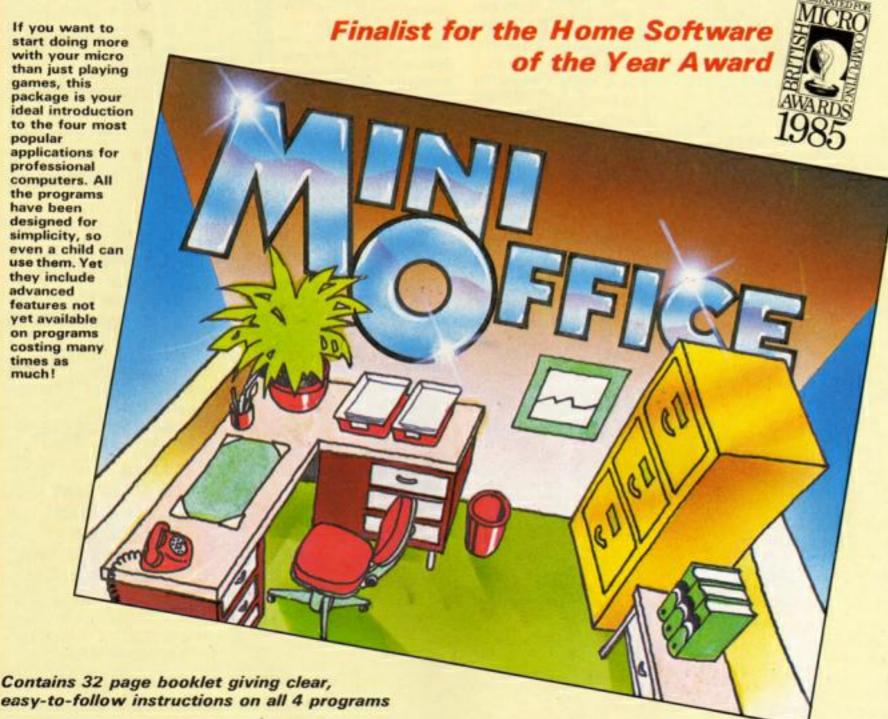
Recently I got a copy of Acornsoft Chess and find it impossibly slow. Is there any way I can speed it up?

Failing this can you recommend a program that is fast enough and difficult enough to give a reasonable game? - D.J. Gormley, Weston Coyney, Staffs.

 Acornsoft's Chess is rather slow and the only way to speed it up is to upgrade your Electron by adding Slogger's Turbo

Have any of our readers come across a particularly good chess program?





Word Processor: Ideal for writing letters and reports. There is a constant display of both time and word count, plus a words-per-minute display to encourage the budding typist! A unique feature is the double-size text option in both edit and printer mode - perfect for young

Database: You use this for storing information, just like an office filing cabinet. Facts you have entered can be quickly retrieved by just keying in a word or part of a word. They can be sorted, replaced, saved for future use or printed

children and people with poor

Spreadsheet: Enables you to use your micro for home accounts or pocket money records. It creates a display of numbers in rows and columns. Continuous updating is possible, and a changed figure can be instantly reflected throughout the rest of the spreadsheet. Your results can be saved, to be used for future updates, or can be fed into its associated program . .

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More great Electron games

This month we introduce a new volume in our Ten of the Best series - 10 more games to give you many hours of fun and entertainment.

These three packages are crammed with the best games from the last 18 months of Electron User. As an added bonus a previously unpublished game has been added to each one - stunning machine code masterpieces from our technical wizard, Roland Waddilove.

So give yourself a treat . . . with the most popular games compilations we've ever produced.





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Volume 1

Jam Butty: Machine code simulation of high drama on a building site.

Golf: Play a round by yourself, or play against your pals.

Haunted House: Fight against all the odds to get out alive.

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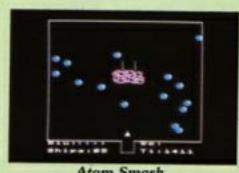
Rally Driver: All the thrills of high-speed driving, with none of the risks.

Alphaswap: Your letters are in a twist. Can

you put them in order? Knockout: Fast and furious action as you batter down a brick wall.

Money Maze: Avoid ghosts and collect coins in an all-action arcade classic.

Lunar Lander: The traditional computer game specially written for the Electron.



Atom Smash

Volume 2

Atom Smash: Machine code thrills as you help to save the world from destruction. Bunny Blitz: Go egg collecting, but keep

away from the proliferating rabbits. Castles of Sand: Build castles – but beware

the rising tide and hungry sandworms. Reaction Timer: Test your reactions with this traffic lights simulation.

Solitaire: The Electron version of the age-old game of logic and patience.

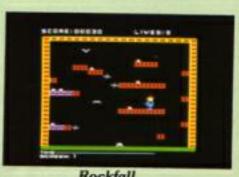
Jumper: Jump for your life in this exciting arcade action game.

Break free: Test your wits and reflexes in this popular classic ball game.

Code Breaker: Crack the code in a colourful if frustrating brainteaser.

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Star Fighter: Attack the bandit ships in this fast-moving 3D punch-up.



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Volume 3

Rockfall: Come diamond mining in this fun packed game with its own screen designer. Karate Warrior: Win your black belt in this

karate skill. Grand Prix: Battle your way into the lead in this tricky racing simulation.

Invasion Force: Can you survive wave after wave of relentlessly advancing aliens?

Grebit: Guide the frog across the busy road then across the fast-flowing river!

Fruit Worm: Steer the worm towards the fruit while avoiding rocks and its ever-growing tail. Manic Mole: Watch out for melting platforms and conveyor belts in your quest for jewels. Skramble: Fly your fighter fast and low over the landscape to penetrate enemy territory. Mr Freeze: You'll need speed and strategy to reach the ice blocks before they melt away. Paint Roller: Steer a speeding roller, run over paint pots but keep clear of the rocks.

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This could be your last chance to build up a library of fun and knowledge from our back issues!

Bundle 3

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Packed with some of the best games we've published from fast arcade action to mind boggling adventures. Save the Earth in Space Battle, escape from the maze in Craal, skim over alien planets in Skramble and go Grand Prix racing.

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£5.90 each bundle

 and don't forget a binder to keep them in - it's only £3.95.

To order, use the form on Page 53

Programs from back issues of Electron User - on tape!

January 1987

Grid Warrior Battle with alien gladiators deep in space. Mode 7 A Mode 7 simulator providing teletext graphics. Smiley Hunt The final version of Al's scintilating magagame. 10 Liners Zap the alien intruder and dodge the asteroids. Lister A utility to enable you to list programs directly from disc or tape.

December 1986

Santa's Sleigh Help Father Christmas fill his sleigh with presents in this fast arcade game. Yule Spell Spelling can be fun with this seasonal variation on the old favourite hangman. Pogo A Logo turtle graphics compiler. Function Key Lister Keep track of your function key definitions with this helpful utility. 10 Liners Two short but impressive graphics demonstrations.

November 1986

TRAIN TROUBLE You've just robbed a bank. Can you escape the forces of law and order in this chase over the carriages of a fast moving express? DAY AT THE RACES You can gamble away to your heart's content in safety with our entertaining two player horse racing game. BASIC COMPILER This superb utility will turn your Basic programs to machine code in no time at all. 10 LINERS A routine from our fascinating series of short programs.

October 1986

RAT CATCHER Try your hand at pest control with this fast action arcade game. MATHS RUN Put your powers of mental arithmetic to the test with this educational program. BOS This on screen editor will take the tedium out of debugging listings and sort out your typing slips. CROSSWORD Two programs for crossword lovers – one to design crosswords and the other to help you solve them. + BONUS game: QUASIMODO'S QUEST Rescue Esmerelda in this colourful version of the all time favourite.

September 1986

CAVERN CAPERS Blast your way from the depths of the labyrinth to escape from the planet. DRAW WRITER A superb utility to translate your on screen graphics to the procedures to create them. COMPANY COUNT Work your way up the company pecking order in this educational maths test. TEN LINERS Another short but fascinating program. + BONUS game: ROCKFALL Go diamond mining in this intriguing multi-screen arcade romp.

August 1986

HOWZAT! A vivid recreation of a day's test cricket for two players. 3D MAZE Quick reactions and a sense of direction are needed to escape from our twisty maze. TEXTED Let this versatile text editor turn your micro into an electronic typewriter. DRIVER A powerful printer driver for View.

July 1986

ROYAL WEDDING Celebrate the royal event with our ingenious sliding block puzzle. SNAPDRAGON Two player version of the classic card game.

ATTRIBUTES Colourful two player strategy game. FORMATTER Make your listings easier to read. DISCS Extended star commands. EXTRA COMMANDS A WHILE . . . WEND command for your micro. PLUS superb digitised picture of Andrew and Sarah.

June 1986

FISHING Enjoy a quite day by the river, and maybe catch your tea as well!

TACTICAL PURSUIT A two player strategy game played with pawns on a chess board. MINIBASE Create an electronic telephone directory. EXTRA COMMANDS Add more commands to Basic. SCREEN DUMP Multi-tone screens dumps for Epson compatible printers.

May 1986

MISSILE JAMMER Defend the city of Pezina from a missile invasion. VECTOR LETTERS Use *LINE to create double height text. DEGREES Convert from Centigrade to Fahrenheit and vice-versa. CROCODILE TEARS Spell well or end up as a crocodile's dinner. ZAP Blast the marauding aliens. EXTRA COMMANDS Adding new keywords to Basic.

April 1986

INVASION FORCE Exciting zap 'em

space game. EASTER EGG HUNT
Seasonal game using compass points.
BACH TO BASICS Music tutor. NOTICE
BOARD Text scrolling utility. SEARCH
and RECOVER Two routines from the
disc article. NOTEBOOK Recursion
backwards.

March 1986

GRAND PRIX Exciting race game. DICER A clever test of strategy. MARCHING ORDER Counting and ordering numbers. FIND AND REPLACE Useful editing program. SECTOR EDITOR Excellent disc utility. TIMEPIECE Superb graphics demonstration. OXO Game of cunning. TRICIRC A circle of triangles.

February 1986

NECROMANCER Superb text adventure.
GREBIT Arcade action. FAST BACKUP
Disc utility. MACHINE CODE How to
write an arcade game. TAPEDISC More
software transferring techniques.
SIDEWAYS RAM Example program.

January 1986

FRUIT WORM An arcade classic.
HELICOPTER RESCUE Pilot an air sea
rescue helicopter. MACHINE CODE
Detect collisions between sprites.
TAPEDISC Transfer your software to
disc. MODE012 Multi-Mode screens.

December 1985

GET SET SANTA Christmas fun collecting presents. MISSILE ATTACK Save your cities! PROGRAM PROBE Using joysticks. SPACE COUNT Counting for youngsters. CHRISTMAS CARD Cards and carols for all. DISC MENU Disc Menu creator.

November 1985

KARATE WARRIOR Electrifying combat ULA Mode 6 Mode 7! PAINT ROLLER Colourful arcade action. DEFUSE Beware the bombs. SPRITE PRINT Machine code graphics utility. TRAIN Far from stationery graphics.

Save wear on your fingers and ensure all your programs are error-free by using our monthly tapes. They are only: £3.75.

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DURING the course of developing programs in Basic I often encounter programming problems to which I have already found solutions in previous programs.

But one of the bugbears of writing large programs in BBC Basic is the lack of any substantial facility for transferring macros, snippets of programs or routines from tape or disc into memory.

Sections of programs can be saved to disc or tape by *SPOOLing them. Later they can be *EXECed back into another program.

To some extent the use of *SPOOL/*EXEC helps.

But this is quite long winded if the routine you want is very short or you just want to check one line of a program to see how you solved a particular programming problem.

The trouble is that you must save the program you're writing and load the program you want to crib from.

Then you must either print or write by hand the routine you're after, reload the program under development and type in the additional lines.

Lister is essentially a fast cribbing utility which enables you to list a program directly from tape or disc without corrupting the program in memory.

Enter and run Lister to set up the machine code. It is assembled to page &C so save it with:

*SAVE LISTER COO DOO

To use Lister:

*LOAD LISTER CALL &COO

and enter the filename of the program you want to list.

Don't forget you can freeze the display with Control+Shift and you can enable paged mode before calling Lister with Control+N.

You can escape at any time but if you do you'll need to close the file with:

*CLOSE

If you're using userdefined characters you'll



IAN JONES offers a fast cribbing utility to help you develop Basic programs

need to load Lister each time you want to use it.

If you're not, load it before you start a programming session and it's there whenever you need it - just call &C00.

Lister occupies page &C and to make it as compact as possible the utility uses many built in Basic rom routines.

To ensure that Basic is paged in the rom number (10 or 11) is stored in the ram copy at &F4 and rom paging register at &FE05.

This enables the utility to run directly from disc by typing *LISTER since in this case the ADFS or DFS rom would still be paged in. Tape owners must *RUN LISTER.

Having ensured that the Basic rom is paged in it then prompts you for a filename.

A routine at &BFCF prints the prompt string and osword is used with the accumulator set to zero to input the name. The resulting string is stored at INBUFF.

The file is opened and read one byte at a time using osbget. If the byte is &OD the routine line is entered to print the line number which follows.

The routine at &991F is used which expects the two byte line number in the two

least significant bytes of the Basic integer accumulator INTA which comprises the four bytes &2A to &2D.

If the byte read from the file is greater than &80 it must be a tokenised Basic keyword. The rom routine at &B50E is used to expand and print a token.

If the byte is &8D this indicates that a tokenised line number follows and is found following GOTOs and GOSUBs.

The subroutine linetoken takes the three byte tokenised line numbers converts them to a two byte form and calls &991F to print it.

All other bytes are assumed to be Ascii characters and are printed as normal.

Lister is an invaluable utility which will speed up program development.

It's so useful you'll wonder how you ever managed without it.

Lister listing

18REM Lister 20REM By Ian Jones 38REM (c) Electron User 48MODE 6

50PROCassemble 68+SAVE LISTER COS DOS

78END

SEDEF PROCasseable

901sb=&2A

108asb=&28

110osfind=&FFCE

120osbget=&FFD7

13Boswrch=&FFEE

148osword=&FFF1

150printeess=&BFCF

160FOR IX=0 TO 2 STEP 2

178P%=&C88

18000PT IX

198.page_in_basic

200 LDA#10

218 STA&F4 220 STA&FE05

230.openfile

240 JSRprintness

258 EQUS"FILENAME: "

268 NOP

270 LDA#8

288 LDX#INPARAM MOD256

298 LDY#INPARAM DIV256

300 JSRosword

310 BCCopenin

320 RTS

Lister listing

From Page 55

330.openin \open file

348 LDA#&48

350 LDX#INBUFF MOD 256

368 LDY#INBUFF DIV 256

370 JSRosfind

388 STAchan

398.read \main loop

400 LDYchan

418 JSRosbget

428 STAchar

438 CMP#&BD \new line

440 BNEngline

450 JMPline

468. noline

478 LDAchar

488 CMP#&88 \token?

498 BMIvdu

500 LDAchar

518 CMP#&8D \number?

528 BNEnottoken

530 JMPlinetoken

548. nottoken

550 LDAchar

560 JSR&B50E \print token

570 JMPread

580.vdu \print Ascii

598 LDAchar

600 JSRoswrch

610 JMPread

This is one of hundreds of programs now available FREE for downloading on

NicroLink

628.line \line number

630 JSR&BC25 \CR

640 LDYchan

650 JSRosbget

668 STARSD

678 CMP#&FF \end?

680 BNEokline

698 JSRendoffile

700 RTS

710. okline

720 LDYchan

738 JSRosbget

748 STALsb

758 JSR&991F

760 LDYchan

778 JSRosbget

788 JMPread

790.endoffile \close

988 LDA48

818 LDY chan

820 JSRosfind

838 RTS

848.linetoken

858 LDYchan

868 JSRosboet

878 STAbyte1

880 LDYchan

898 JSRosbget

900 STAbyte2

918 LDYchan

928 JSRosbget

930 STAbyte3

948 ASLbytel: ASLbytel

950 LDAbytel:AND#&C0:EORb

yte2:STAlsb

960 ASLbytel: ASLbytel

978 LDAbytel:EORbyte3:STA

asb

980 JSR&991F

998 JMPread

1888, INPARAM

1018 EQUW INBUFF

1828 EQUB 18

1838 EQUB 32

1848 EQUB 255

1859. INBUFF

1868 EQUS STRING\$ (18. " ")

1070.chan EQUB 8

1888, char EQUB 8

1898.byte1 EQUB 8

1188.byte2 EQUB 8

1118.byte3 EQUB @

11207

113BNEXT

1148ENDPROC

This listing is included in this month's cassette tape offer. See order form on Page 53.

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'An excellent mixture of games' ... Personal Software - Autumn 1983.

EDUCATIONAL 2

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BBC/ELECTRON Although similar to Educational 1 this tape is more advanced and aimed at seven to twelve year olds. The tape includes MATH 1, MATH 2, AREA, MEMORY, CUBECOUNT and SPELL.

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These are excellent programs which teachers on the project have no hesitation in recommending to other teachers.... Computers in Classroom Project.

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FUN WITH WORDS BBC/ELECTRON Start your fun with alphabet puzzle, continue your play with VOWELS, learn the difference between THERE and THEIR, have games with SUFFIXES and reward yourself with a game of HANGMAN.

'Very good indeed' ... A&B Computing - Jan/Feb 1984

JIGSAW AND

SLIDING PUZZLES by P. Warner BBC/ELECTRON

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There are two jigsaw and four sliding puzzles on a 3×3 and 4×4 grid. Each program starts off at an easy level to ensure initial success but gradually becomes harder. It helps children to develop spatial imagination and in solving problems. The tape includes: OBLONG, JIGSAW, HOUSE, NUMBERS, CLOWN and LETTERS.

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Hardware projects

MANY Electron owners, having hammered the living daylights out of the keyboard of their machine playing yet another game of "zap the green things" no doubt bought a Plus 1 to use joysticks and help preserve the keyboard.

However the Plus 1 is more than a simple joystick port and in this short series I'll explain in simple terms this aspect of its hardware.

We'll look at some of the many different devices we can plug into it, the software needed to access it and also provide a few ideas for applications.

For those of you who've read things like "minimum impedance of 10k ohms" or "heat sensitive transducers" in the Plus 1 User Guide and have given up in disgust, don't worry – we start off this month with a beginners guide to the world of analogue and digital systems, volts and ohms.

The joystick port on the Plus 1 is also known as an analogue interface and as we'll see, provides us with a means of sensing what's going on in the world.

You might be aware that your Electron only understands two things – yes and no, true and false, 0 and 1, call them what you will.

Everything that the Electron does can be thought of as ultimately involving a chain of these yes/no decisions.

Indeed, the actual electrical signals that whizz around the Electron's innards are also of two values, 5V, which we often call high or 1, and 0V, which we often call low or 0.

The term digital computer

Get the most out of your Plus 1

JOE PRITCHARD starts a new series on the multitude of jobs this analogue interface can handle

is given to machines that carry out their work using these digital signals. The Electron therefore understands only two levels of electrical voltage – 0V and 5V.

Of course the real world isn't like this at all. For instance, it doesn't change from bright sunshine to darkest night whenever a cloud passes over the sun; we have a gradual fall in the light level and a gradual

increase as the cloud passes.

A further example is the gradual increase in the speed of a car as you press the accelerator. The speed increases smoothly from 0 to 60 rather than suddenly jumping.

Such systems, in which properties change smoothly over a range of values, are called analogue systems.

A digital system will have a finite number of allowable

values, whereas an analogue one can have an infinite number of values, each slightly different from the others.

The analogue port of the Plus 1 provides us with a means of getting the Electron to look at these smoothly changing quantities in the world.

An analogue quantity must be converted into an electrical signal – a voltage. This can be read and converted by the analogue port into a digital quantity – a number that represents it. For this reason the circuit in the Plus 1 that performs this feat is called an Analogue to Digital Converter or ADC.

The ADC takes an input in the form of a voltage and outputs a number corresponding to its size. The larger the voltage the bigger the number the ADC outputs. Figure 1 shows this diagramatically.

Any quantity in the real world such as pressure, temperature, light, sound and so on can be converted into an electrical signal and can be measured using an ADC.

In a perfect world the conversion of an analogue quantity to its digital equivalent would occur instantaneously. But in reality the conversion takes a finite period called the conversion time.

Thus the output from the ADC can be seen as a series of snapshots of the input, each separated from the

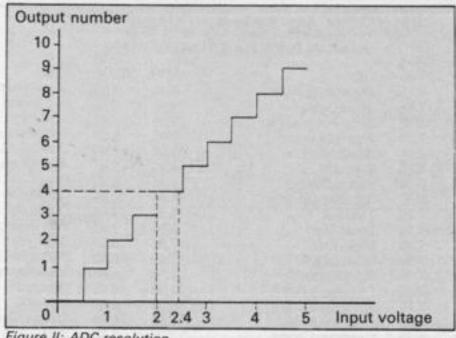


Figure II: ADC resolution

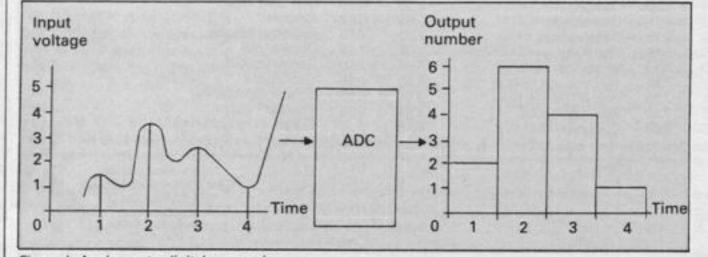


Figure I: Analogue to digital conversion

Hardware projects

From Page 57

next by the conversion time. This varies depending on

the type of ADC and for our Plus 1's converter it's about 10 mS. That is one conversion every one hundredth of a second.

This might sound fast, but in fact it's quite slow when we think of some ADCs that gallop along at tens or hundreds of thousands of conversions per second.

ADCs usually give their output as 8 or 12 bit integers. The number of bits in the output is called the resolution of the ADC.

The resolution is simply a measure of the fine detail that an ADC can see in the input.

For example, let's say we've got an input signal of one unit to an ADC with four bit resolution - it doesn't matter what this unit is.

This ADC can output 2'4 different numbers in the range 0 to 15. Suppose our input signal gives an ADC output of 15, and if we input 0 units we get 0 at the output.

This gives us, between 0 and 1 unit, 16 different output values. Figure II shows the analogue input and the digital output.

You can see that slightly different input voltages will therefore give the same output number. The values 2.0 and 2.4 will both give an output of 4.

To ensure that input signals of different magnitudes are distinguishable by this chip they have to be at least 1/16 of a unit apart. The resolution is therefore 1/16 of a unit.

If the input quantity is in volts, and 10 volts gives the maximum output, we'd say that the resolution is 10/ 16ths of a volt.

If we increase the resolution of the ADC we decrease the size of the steps and allow the ADC to register inputs with smaller changes as different.

It's a bit like the difference between a Mode 2 and a Mode 0 screen. Think of the screen pixel as the step size or resolution. The smaller the pixel is the more detail we can see on the screen.

The Plus 1's ADC outputs an 8 bit integer, thus it provides 2°8 or 256 different numbers.

A low input voltage will give a zero digital output and the highest input voltage allowed will give a digital output of (2'n)-1, where n is the number of bits of resolution that the ADC has.

Going outside the permissable voltage range can damage the ADC, so take

Total

care. The input range for the Plus 1's ADC is 0V to 1.8V maximum.

After all this talk about ADCs we still have to provide a means of converting the real world quantity of interest into a voltage for the ADC to convert. This is done by a device called a transducer.

This is an electronic component which converts a physical quantity like motion, pressure, weight or light level into an electrical

For instance a heat sensitive transducer converts changes in temperature into a changing voltage. This can then be fed into an ADC. We'll look at some transducers in future parts of the series.

 Armed with this information next month we'll take a look at the Plus 1's ADC in detail.

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Make of Computer

THE Electron is a great little micro and it's amazing what can be done with it. However, nothing is perfect and it has its faults.

Apart from being a bit slow the Electron is also rather short on memory. The BBC Micro is much better off, being both faster and – when using the very memory efficient teletext Mode 7 – having around 7k more ram free.

The memory available on the Electron is further decreased when using high resolution and multicolour graphics modes.

And in Mode 0 with a Plus 3 (which also grabs a huge chunk of ram), you can just about fit a program in to print your name on the screen!

Admittedly I'm exaggerating, but the problem is there. Now Slogger has put an end to the days of "No room" and "Bad MODE" with its Master Ram Board.

This provides the Electron with a staggering 28k of memory in any screen mode and a few other goodies besides.

But first of all, how's it done?

The Master Ram Board adds 32k of shadow ram and is essentially the same as found in the BBC B+.

The operating system is patched and the Electron uses this extra ram rather than the built-in memory for your programs.

What this means is that the micro doesn't use any of the memory allocated for your program to store the screen display.

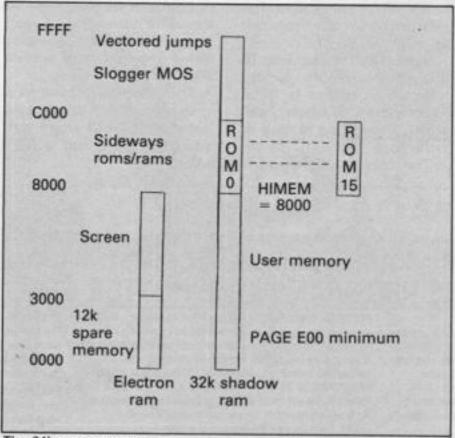
So, HIMEM is set to &8000 regardless of mode and whatever the operating system needs for the screen is taken from the built-in ram.

There are both advantages and disadvantages to this system as we'll see later.

An additional bonus is that Slogger's Turbo Driver is built-in with the shadow ram. This speeds up the Electron by as much as 300

Ramming home more memory

JOE PRITCHARD tries out the Slogger Master Ram Board and enjoys having 28k of memory in any screen mode



The 64k memory map

per cent depending on the screen mode.

When it's on you can't access the shadow ram but it is useful for speeding up games and breathes new life into old software. You'll find a full review of this in the July 1986 issue of Electron User.

The Master Ram Board is fitted by Slogger; simply post your Electron to them and back it comes with the only visible change being a small three-way toggle switch on the left of the case.

This can be used at any time, even with the machine turned on, to change the operating mode of the Electron.

However, doing so crashes the computer and Control+ Break is needed to reset the micro. This is quite normal.

The positioning of the switch gave rise to a small criticism of the board, in that I was working with the Electron on a crowded desk and all of a sudden it froze up.

Nothing at all wrong with the board, I'd just knocked something against the switch and accidentally changed the operating mode.

In the first position the Electron behaves as normal, in the second the shadow ram is switched in and in the third the turbo is switched on.

With the switch in normal

mode there is nothing untoward noticeable. The Electron acts as it always has.

Switching to shadow mode and pressing Control-+Break produces the start up message Acorn Electron 64k.

HIMEM in all screen modes is then &8000 giving a maximum of 28k of ram free. The extra memory can be used by word processors, databases, spreadsheets, languages and so on.

For instance, word processors could have text files of up to 28k resident in memory and use either 40 or 80 column screen modes.

All legally written software will work but programs which use illegal methods – such as directly accessing the screen memory – will not run.

In both turbo and shadow ram modes there is quite a significant increase in performance.

Table I shows the timings for some simple programs running on the BBC Micro, standard Electron and Electron in either shadow or turbo mode – the speed is the same.

Test 1 was run in Mode 6 and calculated and printed the SIN, COS and TAN of the numbers 0 to 100. Test 2 was Test 1 carried out in Mode 0 to see the effect of changing mode.

Test 3 dimensioned and filled a 1000 element array in Mode 6, and Test 4 did the same in Mode 0. Finally, Test 5 drew 100 random

Hardware review

From Page 59

triangles in Mode 2.

As can be seen, as well as adding extra memory shadow mode also speeds up the Electron and is directly comparable to the BBC Micro.

In addition, there are no significant variations in the execution time of programs running in different modes, unlike the standard Electron.

The days of changing to Mode 6 to do your number crunching, then back to Mode 2 to display the results are gone with the Slogger board.

In shadow mode the Electron's built-in ram is used for the screen display while your program is in shadow ram.

Of course the screen memory doesn't take up all 32k of ram and the built-in ram that isn't being used for the screen from address 0

	Test	Electron	Turbo	BBC	
1	1	20.19	14.37	13.77	
1	2	41.44	14.99	13.68	
1	3	3.07	2.32	2.28	
1	4	5.98	2.32	2.28	
1	5	24.37	8.99	8.86	

Table I. Speed Tests in seconds.

up to the screen start is free for your use. It can be used as a printer buffer or for data storage for instance.

This memory will be at least 12k and its actual size depends on the screen mode selected. With Mode 0, there is 12k to play with and with other modes that consume less ram there can be up to 20k free.

Basic can't make use of this extra memory, except indirectly. Access is by a new operating system call which allows you to read or write to it.

The fact that programs

run in shadow ram and that the screen memory is in the old Electron ram gives rise to the one unavoidable drawback with most shadow ram systems, not just this one.

Programs that access the screen memory directly will not work in shadow ram. So for some games you'll need to run the Slogger board in either turbo mode or normal Electron mode.

The Slogger board will give you more space and extra speed, but won't turn your Electron into a BBC Micro.

Finally, the board provides a new operating system rom replacing the old. This has the same legal entry points as the Electron OS, and adds the new OS call mentioned above.

On the whole I liked it very much. It's a good piece of equipment which will no doubt find much use.

The increase in speed provided by the shadow ram will also be extremely valuable and the additional feature of the turbo mode for speeding up games is great.

I can thoroughly recommend it.

Product: Master Ram Board Price: £54.95 (kit), £64.95 (fitted) Supplier: Slogger, 107 Richmond Road, Gillingham, Kent ME7 1BR.

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